

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-17-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP07  
 Investigator(s): J Blum & C. Schudel Landform (hillside, terrace, hummocks, etc.): old outwash fan  
 Local relief (concave, convex, none): none Slope (%): 2  
 Subregion: \_\_\_\_\_ Lat: 60.470198 Long: -149.209463 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Aluvial Deltaic Fan NWI classification: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>✓</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>✓</u>
Hydric Soil Present? Yes _____ No <u>✓</u>	
Wetland Hydrology Present? Yes _____ No <u>✓</u>	
Remarks: <u>Representative of upl. community in old outwash fan. New/recent succession of cottonwoods &amp; v. tall willow trees</u>	

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Salix Alexensis</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>5</u>				
50% of total cover: <u>2.5</u>				
20% of total cover: <u>1</u>				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Populus Balsamifera</u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Salix Sitchensis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	OBL species <u>0</u> x 1 = <u>0</u>
3. <u>Salix Alexensis</u>	<u>10</u>	_____	<u>FAC</u>	FACW species <u>0</u> x 2 = <u>0</u>
4. _____	_____	_____	_____	FAC species <u>40</u> x 3 = <u>120</u>
5. _____	_____	_____	_____	FACU species <u>50</u> x 4 = <u>200</u>
6. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
Total Cover: <u>80</u>				Column Totals: <u>90</u> (A) <u>320</u> (B)
50% of total cover: <u>40</u>				Prevalence Index = B/A = <u>3.56</u>
20% of total cover: <u>16</u>				
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Chamerion latifolium</u>	<u>3</u>	<u>Y</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Agrostis gigantea</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index is ≤3.0
3. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>5</u>				
50% of total cover: <u>2.5</u>				
20% of total cover: <u>1</u>				
Plot size (radius, or length x width) <u>70' rad</u>		% Bare Ground <u>30</u>		
% Cover of Wetland Bryophytes _____		Total Cover of Bryophytes <u>0.5</u>		
(Where applicable)				

Remarks: well establish cottonwood saplings, at least 5 years old (estimated?) photos 685-88

## SOIL

Sampling Point: DP 07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5							colloidal & gravel	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
☐ Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

## Remarks:

Dug a 5" deep pit - hit resistance at tightly packed gravels. V. dry gravel/sand/silt.

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☒ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2) too elevated  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No ✓ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No ✓ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No ✓ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

Old outwash fan. Dry & well drained

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Mouse Pass Sampling Date: 7-17-18  
 Applicant/Owner: Kenai Hydro Sampling Point: DPO8  
 Investigator(s): J Blum & T. Schudel Landform (hillside, terrace, hummocks, etc.): 1500 ft from lake edge  
 Local relief (concave, convex, none): - Slope (%): 1  
 Subregion: \_\_\_\_\_ Lat: 60.471896 Long: -149.205185 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Aluvial Deltaic Dep. NWI classification: PSSI/EMIB  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>Representative of s.s + herbaceous community on North side of large outwash fan</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>4</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100%</u> (A/B)
4. _____				Prevalence Index worksheet:	
Total Cover: _____				Total % Cover of:	Multiply by:
50% of total cover: _____ 20% of total cover: _____				OBL species	<u>10</u> x 1 = <u>10</u>
Sapling/Shrub Stratum				FACW species	<u>5</u> x 2 = <u>10</u>
1. <u>Alnus viridis</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	FAC species	<u>80</u> x 3 = <u>240</u>
2. <u>Sal. Sitchensis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FACU species	<u>0</u> x 4 = <u>0</u>
3. <u>Sal. alaxensis</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	UPL species	<u>0</u> x 5 = <u>0</u>
4. _____				Column Totals:	<u>95</u> (A) <u>260</u> (B)
5. _____				Prevalence Index = B/A = <u>2.74</u>	
6. _____				Hydrophytic Vegetation Indicators:	
Total Cover: <u>50</u>				<input checked="" type="checkbox"/> Dominance Test is >50%	
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>				<input checked="" type="checkbox"/> Prevalence Index is ≤3.0	
Herb Stratum				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
1. <u>Agrostis gigantea</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
2. <u>Equisetum hyemale</u>	<u>5</u>		<u>FACW</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
3. <u>Eriophorum angustifolium</u>	<u>5</u>		<u>OBL</u>		
4. <u>Agrostis stolonifera</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>		
5. <u>Equisetum fluviatile</u>	<u>5</u>		<u>OBL</u>		
6. <u>Culmagrostis canadensis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>		
7. _____					
8. _____					
9. _____					
10. _____					
Total Cover: <u>45</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>					
Plot size (radius, or length x width) <u>30</u> % Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>0</u>					
(Where applicable)					
Remarks: <u>photos 705-710</u>					





## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-17-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP09  
 Investigator(s): J. Blank C. Schudell Landform (hillside, terrace, hummocks, etc.): Lakeshore  
 Local relief (concave, convex, none): — Slope (%): 1  
 Subregion: 7 Lat: 60.471479 Long: -149.250 Datum: 205170  
 Soil Map Unit Name: Deltaic Alluvial Deltaic Dep. NWI classification: PSS1B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No — (If no, explain in Remarks.)  
 Are Vegetation —, Soil —, or Hydrology — significantly disturbed? No — Are "Normal Circumstances" present? Yes X No —  
 Are Vegetation —, Soil —, or Hydrology — naturally problematic? No — (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>✓</u> No <u>—</u>	Is the Sampled Area within a Wetland? Yes <u>✓</u> No <u>—</u>
Hydric Soil Present?	Yes <u>✓</u> No <u>—</u>	
Wetland Hydrology Present?	Yes <u>✓</u> No <u>—</u>	
Remarks: <u>Pt. is representative of the typical AS willow-alder community observed throughout area</u>		

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>—</u>				Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>—</u>				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. <u>—</u>				Prevalence Index worksheet:
Total Cover: <u>—</u>				Total % Cover of:
50% of total cover: <u>—</u> 20% of total cover: <u>—</u>				Multiply by:
Sapling/Shrub Stratum				OBL species <u>5</u> x 1 = <u>5</u>
1. <u>Alnus viridis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	FACW species <u>5</u> x 2 = <u>10</u>
2. <u>Sal. sitchensis</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>90</u> x 3 = <u>270</u>
3. <u>Sal. alexensis</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>0</u> x 4 = <u>0</u>
4. <u>—</u>				UPL species <u>0</u> x 5 = <u>0</u>
5. <u>—</u>				Column Totals: <u>100</u> (A) <u>285</u> (B)
6. <u>—</u>				Prevalence Index = B/A = <u>2.85</u>
Total Cover: <u>80</u>				Hydrophytic Vegetation Indicators:
50% of total cover: <u>80</u> 20% of total cover: <u>16</u>				<u>X</u> Dominance Test is >50%
Herb Stratum				<u>X</u> Prevalence Index is ≤3.0
1. <u>Agros. gigantea</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
2. <u>Eg. humale</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
3. <u>Eg. fluviatile</u>	<u>5</u>	<u>Y</u>	<u>OBL</u>	
4. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
5. <u>—</u>				
6. <u>—</u>				
7. <u>—</u>				
8. <u>—</u>				
9. <u>—</u>				
10. <u>—</u>				
Total Cover: <u>20</u>				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
50% of total cover: <u>20</u> 20% of total cover: <u>4</u>				
Plot size (radius, or length x width) <u>—</u> % Bare Ground <u>—</u>				Hydrophytic Vegetation Present? Yes <u>✓</u> No <u>—</u>
% Cover of Wetland Bryophytes <u>—</u> Total Cover of Bryophytes <u>—</u> (Where applicable)				
Remarks: <u>photos 711-714 GPS 24</u>				



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-17-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 10  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): gravel island  
 Local relief (concave, convex, none): none Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.472060 Long: -149.204078 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Aluvial Deltaic Dep. NWI classification: P1EM1F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>grasses colonizing in shallow Lake H<sub>2</sub>O</u>	

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>none</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				
Total Cover: _____				Prevalence Index worksheet:
50% of total cover: _____ 20% of total cover: _____				Total % Cover of: _____ Multiply by: _____
Sapling/Shrub Stratum				OBL species <u>30</u> x 1 = <u>30</u> JB
1. <u>none</u>				FACW species _____ x 2 = _____
2. _____				FAC species <u>1520</u> x 3 = <u>4560</u>
3. _____				FACU species _____ x 4 = _____
4. _____				UPL species _____ x 5 = _____
5. _____				Column Totals: <u>4550</u> (A) <u>7590</u> (B)
6. _____				Prevalence Index = B/A = <u>1.67</u> 1.8
Total Cover: _____				50% of total cover: _____ 20% of total cover: _____
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>podagrostis laequeivalvis</u>	<u>4520</u>	<u>Y</u>	<u>OBL</u>	<u>X</u> Dominance Test is >50%
2. <u>poa palustris</u>	<u>2015</u>	<u>Y</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Carex lenticularis</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. <u>Eriophorum chamissonis</u>	<u>25</u>		<u>OBL</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. <u>Eriophorum</u>	<u>5</u>			
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>50</u>				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>				
Plot size (radius, or length x width) <u>10' rad.</u> % Bare Ground <u>50</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>0</u>				
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks: <u>Area may be converting back to land photos 715-719</u>				



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-17-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP-11  
 Investigator(s): Blank, C. Schudel Landform (hillside, terrace, hummocks, etc.): Debris fan  
 Local relief (concave, convex, none): convex Slope (%): 3  
 Subregion: Aluvial/Colluvial fan Lat: 60.472895 Long: -149.202918 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: <u>upland area on North end of Lake Inlet area</u>			

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				
50% of total cover: _____				Total % Cover of:
Sapling/Shrub Stratum				Multiply by:
1. <u>Salix barclayi</u>	<u>10</u>	<u>4</u>	<u>FAC</u>	OBL species <u>0</u> x 1 = <u>0</u>
2. _____				FACW species <u>10</u> x 2 = <u>20</u>
3. _____				FAC species <u>40</u> x 3 = <u>120</u>
4. _____				FACU species <u>50</u> x 4 = <u>200</u>
5. _____				UPL species <u>0</u> x 5 = <u>0</u>
6. _____				Column Totals: <u>100</u> (A) <u>340</u> (B)
Total Cover: <u>10</u>				Prevalence Index = B/A = <u>3.4</u>
50% of total cover: <u>5</u>				Hydrophytic Vegetation Indicators:
20% of total cover: <u>2</u>				
Herb Stratum				<input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. <u>Cha. angustifolium</u>	<u>20</u>	<u>4</u>	<u>FACU</u>	
2. <u>Sanguisorba canadensis</u>	<u>10</u>		<u>FACW</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
3. <u>Geranium erianthum</u>	<u>5</u>		<u>FACU</u>	
4. <u>Agrostis gigantea</u>	<u>15</u>	<u>4</u>	<u>PAC</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. <u>Hordeum maximum</u>	<u>20</u>	<u>4</u>	<u>FACU</u>	
6. <u>Equisetum arvense</u>	<u>15</u>	<u>4</u>	<u>FAC</u>	Remarks: <u>photo 748-753</u>
7. <u>Artemisia tilesii</u>	<u>5</u>		<u>FACU</u>	
8. <u>Calamagrostis canadensis</u>	<u>15</u>	<u>4</u>	<u>FAC</u>	
9. _____				
10. _____				
Total Cover: <u>90</u>				
50% of total cover: <u>45</u>				
20% of total cover: <u>18</u>				
Plot size (radius, or length x width) <u>20' rad.</u>			% Bare Ground <u>0</u>	
% Cover of Wetland Bryophytes _____			Total Cover of Bryophytes <u>0</u>	
(Where applicable)				

## SOIL

Sampling Point: DP 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-11							rocks, small + large cobble	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
☐ Underlying Layer  
☐ Other (Explain In Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

## Remarks:

Soil pit to 11" bgs. Clearly non-hydric, dry soil with 4-6" rock fragments. many roots.

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
(includes capillary fringe)Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

No Hyd. indicators

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Giant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-18-13  
 Applicant/Owner: Kenex Hydro Sampling Point: DP12  
 Investigator(s): C. Schwedel J. Blank Landform (hillside, terrace, hummocks, etc.): drainage  
 Local relief (concave, convex, none): concave Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.458302 Long: -149.341426 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: R3UB  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: <u>Documenting this community as a PSS/OM wetland w/ a small R3UB3H running down the middle</u>					

**VEGETATION** - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Tsuga mertensiana</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>5</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____	_____	_____	_____		
Total Cover: <u>10</u>					
50% of total cover: <u>5</u>				20% of total cover: <u>2</u>	
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. <u>Ahus viridis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of:	Multiply by:
2. <u>Cornus canadensis</u>	<u>3</u>	_____	<u>FACW</u>	OBL species <u>0</u>	x 1 = <u>0</u>
3. <u>Arctostaphylos uva-ursi</u>	<u>3</u>	_____	<u>UPL</u>	FACW species <u>5</u>	x 2 = <u>10</u>
4. <u>Menziesia ferruginea</u>	<u>5</u>	_____	<u>FACU</u>	FAC species <u>100</u>	x 3 = <u>300</u>
5. <u>Tsuga mertensiana</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>8</u>	x 4 = <u>32</u>
6. _____	_____	_____	_____	UPL species <u>3</u>	x 5 = <u>15</u>
Total Cover: <u>61.58</u>				Column Totals:	<u>116</u> (A) <u>357</u> (B)
50% of total cover: <u>30.5</u>				20% of total cover: <u>12.2</u>	
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index = B/A = <u>3.08</u>	
1. <u>Equisetum arvense</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators:	
2. <u>Sanguisorba canadensis</u>	<u>5</u>	_____	<u>FACW</u>	<u>X</u> Dominance Test is >50%	
3. <u>Agrostis gigantea</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index is ≤3.0	
4. <u>Cornus canadensis</u>	<u>3</u>	_____	<u>FACU</u>	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
5. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
Total Cover: <u>45.48</u>					
50% of total cover: <u>22.5</u>				20% of total cover: <u>9.6</u>	
Plot size (radius, or length x width) <u>10' rad.</u>				% Bare Ground <u>50</u>	
% Cover of Wetland Bryophytes _____				Total Cover of Bryophytes <u>5</u>	
(Where applicable)				<u>open water</u>	
Remarks: <u>PICS 771-771</u>					





## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-18-18  
 Applicant/Owner: Kenai Hydro Sampling Point: DP13  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside above DP12 drainage  
 Local relief (concave, convex, none): convex Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.458364 Long: -149.341634 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: <u>upland community types typical of upland hemlock community.</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
1. <u>Tsuga mertensiana</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
3. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____
4. _____	_____	_____	_____	
Total Cover: <u>40</u> 50% of total cover: <u>20</u> 20% of total cover: <u>8</u>				OBL species <u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>0</u> x 2 = <u>0</u>
1. <u>Empetrum nigrum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>66</u> x 3 = <u>198</u>
2. <u>Arctostaphylos uva-ursi</u>	<u>5</u>	_____	<u>UPL</u>	FACU species <u>5</u> x 4 = <u>20</u>
3. <u>Menziesia ferruginea</u>	<u>5</u>	_____	<u>FACU</u>	UPL species <u>5</u> x 5 = <u>25</u>
4. <u>Vaccinium uliginosum</u>	<u>2</u>	_____	<u>FAC</u>	Column Totals: <u>76</u> (A) <u>243</u> (B)
5. <u>Tsuga mertensiana</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index = B/A = <u>3.2</u>
6. <u>Ledum groenlandicum</u> <u>groenlandicum</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% ____ Prevalence Index is ≤3.0 ____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover: <u>36</u> 50% of total cover: <u>18</u> 20% of total cover: <u>7.2</u>				
Herb Stratum				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. <u>None</u>	_____	_____	_____	
2. _____	_____	_____	_____	Remarks: <u>photos 778-782 GPS 9</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90</u> (Where applicable)
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	Remarks: _____
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	

## SOIL

Sampling Point: DP13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>4-0</u>							<u>roots</u>	<u>live layer</u>
<u>0-5</u>	<u>7.5YR 3/4</u>						<u>organics</u>	
<u>5-12</u>							<u>cobble</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
 Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: bedrock? / cobbleDepth (inches): 12"Hydric Soil Present? Yes ☐ No ☒

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☒ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_Water Table Present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_Saturation Present? Yes ☐ No ☐ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-19-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 14  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): depression  
 Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion: \_\_\_\_\_ Lat: 60.458740 Long: -149.366065 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEM1/SS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>Herbaceous-shrub wetland w/ a small [2ft-2ft avg wide] P3UB P3UB running through it</u>	

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>45</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				Total % Cover of:
50% of total cover: _____ 20% of total cover: _____				OBL species <u>45</u> x 1 = <u>45</u>
Sapling/Shrub Stratum				FACW species <u>20</u> x 2 = <u>40</u>
1. <u>Picea glauca</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	FAC species <u>26</u> x 3 = <u>78</u>
2. <u>Salix barclayi</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>5</u> x 4 = <u>20</u>
3. <u>Betula glandulosa</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	UPL species <u>0</u> x 5 = <u>0</u>
4. <u>Ledum decumbens</u>	<u>3</u>		<u>FAC</u>	Column Totals: <u>96</u> (A) <u>183</u> (B)
5. <u>Empetrum nigrum</u>	<u>3</u>		<u>FAC</u>	Prevalence Index = B/A = <u>1.91</u>
6. <u>Vaccinium uliginosum</u>	<u>3</u>		<u>FAC</u>	Hydrophytic Vegetation Indicators:
Total Cover: <u>31</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>15.5</u> 20% of total cover: <u>6.2</u>				<u>X</u> Prevalence Index is ≤3.0
Herb Stratum				Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Equisetum <del>fluviale</del></u>	<u>30</u>	<u>Y</u>	<u>OBL</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Sagittaria canadensis</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Carex leptalea</u>	<u>5</u>		<u>OBL</u>	
4. <u>Comarostaphylis palustris</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
5. <u>Carex canescens</u>	<u>5</u>		<u>FACW</u>	
6. <u>Carex media</u>	<u>5</u>		<u>FACW</u>	
Total Cover: <u>65</u>				
50% of total cover: <u>32.5</u> 20% of total cover: <u>13</u>				
Plot size (radius, or length x width) <u>20' rad</u> % Bare Ground <u>5 open</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90</u>				
Remarks: <u>Photos 716 - 803</u> <u>GPS 2 start of east fork channel</u> <u>GPS 3 " west "</u> <u>" 4 data pt 14 (merge of e &amp; w forks)</u> <u>" 5 channel @ edge of corridor where it merges w/ prev. mapped</u>				



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-19-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 15  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside  
 Local relief (concave, convex, none): convex Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.458564 Long: -149.365711 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? N Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? N (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: <u>Representative of white spruce upland forest</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea glauca</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
Total Cover: <u>20</u>				Total % Cover of: _____ Multiply by: _____
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				OBL species <u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>0</u> x 2 = <u>0</u>
1. <u>Betula glandulosa</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>52</u> x 3 = <u>156</u>
2. <u>Ledum <del>drummen</del> <sup>greenlandicum</sup></u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>31</u> x 4 = <u>124</u>
3. <u>Empetrum nigrum</u>	<u>10</u>	_____	<u>FAC</u>	UPL species <u>5</u> x 5 = <u>25</u>
4. <u>Arctostaphylos wa-ursi</u>	<u>5</u>	_____	<u>UPL</u>	Column Totals: <u>88</u> (A) <u>305</u> (B)
5. <u>Spiraea stevenii</u>	<u>10</u>	_____	<u>FACU</u>	Prevalence Index = B/A = <u>3.47</u>
6. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
Total Cover: <u>68</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>34</u> 20% of total cover: <u>13.6</u>				_____ Prevalence Index is ≤3.0
Herb Stratum				_____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Chamerion angustifolia</u>	<u>1</u>	_____	<u>FACU</u>	_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Agrostis gigantea</u>	<u>2</u>	_____	<u>FAC</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
3. <u>Calamagrostis canadensis</u>	<u>2</u>	_____	<u>FAC</u>	
4. <u>(totals included w/ shrub)</u>	_____	_____	_____	
5. <u>&lt; 5%</u>	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>✓</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: _____ 20% of total cover: _____				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90%</u> (Where applicable)				
Remarks: <u>photos 804-807</u>				



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-19-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 16  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): edge of river channel  
 Local relief (concave, convex, none): convex Slope (%): 1 fluvial outwash fan.  
 Subregion: \_\_\_\_\_ Lat: 60.405452865 Long: -149.361338 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks: <u>Upland herbaceous community located in numerous low-lying areas in the vicinity.</u>			

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>43</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.66</u> (A/B)
1. <u>None</u>				
2. _____				
3. _____				
Total Cover: _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>80</u> x 3 = <u>240</u> FACU species <u>60</u> x 4 = <u>240</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>140</u> (A) <u>480</u> (B) Prevalence Index = B/A = <u>3.43</u>
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum				
1. <u>Viburnum edule</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Cornus canadensis</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% _____ Prevalence Index is ≤3.0 _____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
3. <u>Rosa acicularis</u>	<u>5</u>		<u>FACU</u>	
4. _____				
5. _____				
Total Cover: <u>45.35</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u>X</u>
50% of total cover: <u>22.5</u> 20% of total cover: <u>9.7</u>				
Herb Stratum				
1. <u>Equisetum arvense</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Horacleum maximum</u>	<u>10</u>		<u>FACU</u>	
3. <u>Allyrium filix-femina</u>	<u>10</u>		<u>FAC</u>	
4. <u>Gymnocarpium dryopteris</u>	<u>5</u>		<u>FACU</u>	
5. <u>Agrostis gigantea</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
6. <u>Cornus canadensis</u>	<u>10</u>		<u>FACU</u>	
7. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
8. _____				
9. _____				
10. _____				
Total Cover: <u>75.105</u>				
50% of total cover: <u>37.5</u> 20% of total cover: <u>14.21</u>				
Plot size (radius, or length x width) <u>20' rad</u> <u>52.5</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>50</u>				
Remarks: <u>photos 828-830</u>				

## SOIL

Sampling Point: DP16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
	Color (molst)	%	Color (molst)	%				
<u>0-6</u>							<u>live roots + organics</u>	
<u>6-7</u>	<u>10YR 3/4</u>	<u>100</u>					<u>silt loam + roots</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  
☐ Other (Explain In Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change In Remarks.

## Restrictive Layer (if present):

Type: rocks / bed rock  
 Depth (inches): 7"

Hydric Soil Present? Yes ☐ No ☒

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain In Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-20-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP17  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): depression  
 Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.4541684 Long: -149.357179 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: Percl/SS/B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) PSS-3/EM13  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_ LS  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: <u>Typical percl/SS community.</u>			

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____				Prevalence Index worksheet:	
Total Cover: _____				Total % Cover of:	Multiply by:
50% of total cover: _____ 20% of total cover: _____				OBL species	<u>10</u> x 1 = <u>10</u>
Sapling/Shrub Stratum				FACW species	<u>18</u> x 2 = <u>36</u>
1. <u>Empetrum nigrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FAC species	<u>81</u> x 3 = <u>243</u>
2. <u>Picea mariana</u>	<u>5</u>		<u>FACW</u>	FACU species	<u>10</u> x 4 = <u>40</u>
3. <u>Picea glauca</u>	<u>5</u>		<u>FACU</u>	UPL species	<u>2</u> x 5 = <u>10</u>
4. <u>Betula glandulosa</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Column Totals:	<u>121</u> (A) <u>369</u> (B)
5. <u>Cornus canadensis</u>	<u>5</u>		<u>FAC</u>	Prevalence Index = B/A = <u>2.8</u>	
6. <u>Vaccinium uliginosum</u>	<u>3</u>		<u>FAC</u>	Hydrophytic Vegetation Indicators:	
7. <u>Ledum decumbens</u>	<u>3</u>		<u>FACW</u>	<u>X</u> Dominance Test is >50%	
8. <u>Arctostaphylos uva-ursi</u>	<u>2</u>		<u>OPL</u>	<u>X</u> Prevalence Index is ≤3.0	
Total Cover: <u>53</u>				Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
50% of total cover: <u>26.5</u> 20% of total cover: <u>10.6</u>				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
Herb Stratum				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
1. <u>Cornus canadensis</u>	<u>5</u>		<u>FACU</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
2. <u>Rubus chamaemorus</u>	<u>10</u>		<u>FACW</u>		
3. <u>Equisetum arvense</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>		
4. <u>Carex pauciflora</u>	<u>10</u>		<u>OBL</u>		
5. <u>Agrostis gigantea</u>	<u>3</u>		<u>FAC</u>		
6. <u>Calamagrostis canadensis</u>	<u>3</u>		<u>FAC</u>		
7. _____					
8. _____					
9. _____					
10. _____					
Total Cover: <u>68</u>					
50% of total cover: <u>34</u> 20% of total cover: <u>13.6</u>					
Plot size (radius, or length x width) <u>20' dia</u> % Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90</u>					
(Where applicable)					
Remarks: <u>collected the sedge</u>					
<u>photos 3155-3162</u>					

## SOIL

Sampling Point: DP 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
<u>3-0</u>							<u>live moss</u>
<u>0-16</u>							<u>organic peat</u>

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

☒ Histosol or Histel (A1)      ☐ Alaska Color Change (TA4)<sup>4</sup>      ☐ Alaska Gleyed Without Hue 5Y or Redder

☐ Histic Epipedon (A2)      ☐ Alaska Alpine Swales (TA5)      ☐ Underlying Layer

☐ Hydrogen Sulfide (A4)      ☐ Alaska Redox With 2.5Y Hue      ☐ Other (Explain in Remarks)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13)      <sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

☐ Alaska Redox (A14)      <sup>4</sup>Give details of color change in Remarks.

☐ Alaska Gleyed Pores (A15)

**Restrictive Layer (If present):**

Type: None found

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
<b>Primary Indicators (any one indicator is sufficient)</b>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>11</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): <u>5</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-20-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DPI8  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside  
 Local relief (concave, convex, none): none Slope (%): 8  
 Subregion: \_\_\_\_\_ Lat: 60.454548 Long: -149.356514 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: <u>Typical white spruce / hemlock / paper birch upland forest community</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula papyrifera</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Tsuga mertensiana</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. <u>Picea glauca</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
Total Cover: <u>80</u>	50% of total cover: <u>40</u>	20% of total cover: <u>16</u>		
Sapling/Shrub Stratum				Total % Cover of: _____ Multiply by: _____
1. <u>Arctostaphylos uva-ursi</u>	<u>5</u>	_____	<u>UPL</u>	OBL species <u>0</u> x 1 = <u>0</u>
2. <u>Ulex</u> <u>Vaccinium uliginosum</u>	<u>10</u>	_____	<u>FAC</u>	FACW species <u>0</u> x 2 = <u>0</u>
3. <u>Menziesia ferruginea</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	FAC species <u>45</u> x 3 = <u>135</u>
4. <u>Empetrum nigrum</u>	<u>10</u>	_____	<u>FAC</u>	FACU species <u>110</u> x 4 = <u>440</u>
5. <u>Tsuga mertensiana</u>	<u>5</u>	_____	<u>FAC</u>	UPL species <u>5</u> x 5 = <u>25</u>
6. <u>Picea glauca</u>	<u>10</u>	_____	<u>FACU</u>	Column Totals: <u>160</u> (A) <u>600</u> (B)
Total Cover: <u>80</u>	50% of total cover: <u>40</u>	20% of total cover: <u>16</u>		Prevalence Index = B/A = <u>3.75</u>
Herb Stratum				Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% _____ Prevalence Index is ≤3.0 _____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>None</u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: _____	50% of total cover: _____	20% of total cover: _____		Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
Plot size (radius, or length x width) <u>20' rad.</u>	% Bare Ground <u>0</u>			
% Cover of Wetland Bryophytes _____ (Where applicable)	Total Cover of Bryophytes <u>75</u>			
Remarks: <u>photos 3163 - 3169</u>				

## SOIL

Sampling Point: DP 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
3-0							live moss & roots	
0-3	2.5Y 4/2						silt loam	
3-9							peat / organics	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Histosol or Histel (A1)   | <input type="checkbox"/> Alaska Color Change (TA4) <sup>4</sup>                                   | <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder |
| <input type="checkbox"/> Histic Epipedon (A2)      | <input type="checkbox"/> Alaska Alpine Swales (TA5)   | <input type="checkbox"/> Underlying Layer                       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)     | <input type="checkbox"/> Alaska Redox With 2.5Y Hue   | <input type="checkbox"/> Other (Explain in Remarks)             |
| <input type="checkbox"/> Thick Dark Surface (A12)  |   |   |
| <input type="checkbox"/> Alaska Gleyed (A13)       | <sup>3</sup> One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, |   |
| <input type="checkbox"/> Alaska Redox (A14)        | and an appropriate landscape position must be present unless disturbed or problematic.            |   |
| <input type="checkbox"/> Alaska Gleyed Pores (A15) | <sup>4</sup> Give details of color change in Remarks.   |   |

## Restrictive Layer (If present):

 Type: bedrock  
 Depth (inches): 9"
Hydric Soil Present? Yes ☐ No ☒

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Secondary Indicators (2 or more required)

## Primary Indicators (any one indicator is sufficient)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Surface Water (A1)       | <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Water-stained Leaves (B9)                     |
| <input type="checkbox"/> High Water Table (A2)    | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Drainage Patterns (B10)                       |
| <input type="checkbox"/> Saturation (A3)          | <input type="checkbox"/> Marl Deposits (B15)                       | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Water Marks (B1)         | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                | <input type="checkbox"/> Presence of Reduced Iron (C4)                 |
| <input type="checkbox"/> Sediment Deposits (B2)   | <input type="checkbox"/> Dry-Season Water Table (C2)               | <input type="checkbox"/> Salt Deposits (C5)                            |
| <input type="checkbox"/> Drift Deposits (B3)      | <input type="checkbox"/> Other (Explain in Remarks)                | <input type="checkbox"/> Stunted or Stressed Plants (D1)               |
| <input type="checkbox"/> Algal Mat or Crust (B4)  |  | <input type="checkbox"/> Geomorphic Position (D2)                      |
| <input type="checkbox"/> Iron Deposits (B5)       |  | <input type="checkbox"/> Shallow Aquitard (D3)                         |
| <input type="checkbox"/> Surface Soil Cracks (B6) |  | <input type="checkbox"/> Microtopographic Relief (D4)                  |
|   |  | <input type="checkbox"/> FAC-Neutral Test (D5)                         |

## Field Observations:

 Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)
Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant lake Corridor Borough/City: Moose Pass Sampling Date: 7-20-13  
 Applicant/Owner: Keneu Hydro Sampling Point: DP 19  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): depression  
 Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.454029 Long: -149.354706 Datum: PSS4/3/PEN1  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PB1H/SS4B B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks:		

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				Total % Cover of: _____ Multiply by: _____
50% of total cover: _____ 20% of total cover: _____				OBL species <u>12</u> x 1 = <u>12</u>
Sapling/Shrub Stratum				FACW species <u>52</u> x 2 = <u>104</u>
1. <u>Salix barclayi</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>19</u> x 3 = <u>57</u>
2. <u>Loium decumbens</u>	<u>7</u>	<u>Y</u>	<u>FACW</u>	FACU species <u>20</u> x 4 = <u>80</u>
3. <u>Empetrum nigrum</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	UPL species <u>0</u> x 5 = <u>0</u>
4. <u>Betula glandulosa</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	Column Totals: <u>103</u> (A) <u>253</u> (B)
5. <u>Picea glauca</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index = B/A = <u>2.46</u>
6. <u>Andromeda polifolia</u>	<u>7</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators:
Total Cover: <u>51</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>25.5</u> 20% of total cover: <u>10.2</u>				<u>X</u> Prevalence Index is ≤3.0
Herb Stratum				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Rubus chamaemorus</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Carex disperma</u>	<u>3</u>	<u>Y</u>	<u>FACW</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
3. <u>Sperberia perennis</u>	<u>2</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Plantantheria dilatata</u>	<u>3</u>	<u>Y</u>	<u>FACW</u>	
5. <u>Equisetum fluviatile</u>	<u>5</u>	<u>Y</u>	<u>OBL</u>	
6. <u>Eriophorum chamissonis</u>	<u>5</u>	<u>Y</u>	<u>OBL</u>	
7. <u>Agrostis gigantea</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	
8. <u>Carex pauciflora</u>	<u>2</u>	<u>Y</u>	<u>OBL</u>	
9. <u>Calamagrostis canadensis</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	
10. _____				
Total Cover: <u>52</u>				
50% of total cover: <u>26</u> 20% of total cover: <u>10.4</u>				
Plot size (radius, or length x width) <u>20' rad</u> % Bare Ground <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90</u>				
(Where applicable)				
Remarks: <u>photos 3176 - 3182 eps 15</u>				

## SOIL

Sampling Point: DP19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (Inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
2-0							live moss
0-17							peat

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: ☒ Histosol or Histel (A1) ☐ Alaska Color Change (TA4)<sup>4</sup> ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer

☐ Histc Epipedon (A2) ☐ Alaska Alpine Swales (TA5)

☐ Hydrogen Sulfide (A4) ☐ Alaska Redox With 2.5Y Hue ☐ Other (Explain in Remarks)

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13) <sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

☐ Alaska Redox (A14) <sup>4</sup>Give details of color change in Remarks.

☐ Alaska Gleyed Pores (A15)

Restrictive Layer (if present):  
 Type: none found  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (any one indicator is sufficient)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>14"</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): <u>5"</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>Highly saturated, peat, live moss</u>		

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7.20.13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP20  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): depression  
 Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.454010 Long: -149.352747 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PSS4BPEM1B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) 3 (PSS316M1B)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks:		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
Total Cover: _____				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>25</u> x 1 = <u>25</u> FACW species <u>25</u> x 2 = <u>50</u> FAC species <u>18</u> x 3 = <u>54</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>68</u> (A) <u>129</u> (B) Prevalence Index = B/A = <u>1.90</u>
1. <u>Betula glandulosa</u>	<u>5</u>		<u>FAC</u>	
2. <u>Ledum decumbens</u>	<u>5</u>		<u>FAC</u>	
3. <u>Empetrum nigrum</u>	<u>5</u>		<u>FAC</u>	
4. <u>Andromeda polifolia</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
5. <u>Vaccinium uliginosum</u>	<u>3</u>		<u>FAC</u>	
6. _____				
Total Cover: <u>38</u>				
50% of total cover: <u>19</u> 20% of total cover: <u>7.6</u>				
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>Prosera rotundifolia</u>	<u>5</u>		<u>OBL</u>	
2. <u>Carex pauciflora</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Rubus chamaemorus</u>	<u>5</u>		<u>FACW</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>30</u>				
50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>100</u>				
(Where applicable)				
Remarks: <u>photos 5183 - 3186 - 0158</u>				

## SOIL

Sampling Point: DP20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>2-0</u>							<u>live moss</u>	
<u>0-16</u>							<u>peat</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☒ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
 Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: none found

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_Saturation Present? Yes ☒ No ☐ Depth (inches): 5"Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-20-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP21  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside  
 Local relief (concave, convex, none): none Slope (%): 2  
 Subregion: \_\_\_\_\_ Lat: 60.454189 Long: -149.351918 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: <u>point representative of typical hummocks, paper birch, white spruce upland forest.</u>		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>#1</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B)
1. <u>Betula papyrifera</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Picea glauca</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>10</u> x 2 = <u>20</u> FAC species <u>3</u> x 3 = <u>9</u> FACU species <u>93</u> x 4 = <u>372</u> UPL species <u>6</u> x 5 = <u>25</u> Column Totals: <u>111</u> (A) <u>426</u> (B) Prevalence Index = B/A = <u>3.84</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>60</u>	50% of total cover: <u>30</u>	20% of total cover: <u>12</u>		
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <u>No</u> Dominance Test is >50% <u>No</u> Prevalence Index is ≤3.0 Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>Arctostaphylos uva-ursi</u>	<u>2</u>	_____	<u>UPL</u>	
2. <u>Menyanthes ferruginea</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Empetrum nigrum</u>	<u>3</u>	_____	<u>FAC</u>	
4. <u>Linnaea borealis</u>	<u>3</u>	_____	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>28</u>	50% of total cover: <u>14</u>	20% of total cover: <u>5.6</u>		
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rubus chamaemorus</u>	<u>2/10</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Chamaenerion angustifolium</u>	<u>1</u>	_____	<u>FACU</u>	
3. <u>Trientalis europaea</u>	<u>1</u>	_____	<u>FACU</u>	
4. <u>Lycopodium annotinum</u>	<u>3</u>	_____	<u>UPL</u>	
5. <u>Cornus canadensis</u>	<u>3</u>	_____	<u>FACU</u>	
6. <u>Empetrum nigrum</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
7. <u>Geocaulon lividum</u>	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>23</u>	50% of total cover: <u>11.5</u>	20% of total cover: <u>4.6</u>		
Plot size (radius, or length x width) <u>20' rad.</u>	% Bare Ground <u>0</u>	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>		
% Cover of Wetland Bryophytes _____	Total Cover of Bryophytes <u>50</u>			
Remarks: <u>photos 3191-93</u>				

## SOIL

Sampling Point: DP 21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
<u>0-3</u>							<u>live organic</u>
<u>3-13</u>	<u>7.5YR 4/6</u>	<u>100</u>					<u>Sandy loam + gravel</u>
<u>13-16</u>	<u>10YR 4/1</u>	<u>100</u>					<u>cobble / bedrock</u>
							<u>sandy clay</u>

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) <sup>4</sup>	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	<sup>3</sup> One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Redox (A14)	<sup>4</sup> Give details of color change in Remarks.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		

**Restrictive Layer (if present):**

Type: bedrock

Depth (inches): 16"

Hydric Soil Present? Yes ☐ No ☒

Remarks:

charcoal in pit  
ash

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
<b>Primary Indicators (any one indicator is sufficient)</b>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-20-13  
 Applicant/Owner: C. Schudel J. Blank Sampling Point: DP 22  
 Investigator(s): Kenny Hydro Landform (hillside, terrace, hummocks, etc.): depression  
 Local relief (concave, convex, none): concave Slope (%): 2 (upper end of wetland)  
 Subregion: \_\_\_\_\_ Lat: -149.350721 Long: 60.454601 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: R2H1/SS1B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) PS1/EMIE  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_ LS  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>Herbaceous - S/B wetland w/ open stunted spruce trees</u>		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea glauca</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
Total Cover: <u>15</u>				Total % Cover of:
50% of total cover: <u>7.5</u> 20% of total cover: <u>3</u>				OBL species <u>35</u> x 1 = <u>35</u>
Sapling/Shrub Stratum				FACW species <u>13</u> x 2 = <u>26</u>
1. <u>Betula glandulosa</u>	<u>5</u>	_____	<u>FAC</u>	FAC species <u>55</u> x 3 = <u>165</u>
2. <u>Salix Barclayi</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>10</u> x 4 = <u>64</u>
3. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
4. _____	_____	_____	_____	Column Totals: <u>119</u> (A) <u>290</u> (B)
5. _____	_____	_____	_____	Prevalence Index = B/A = <u>2.44</u>
6. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
Total Cover: <u>35</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>17.5</u> 20% of total cover: <u>7</u>				<u>X</u> Prevalence Index is ≤3.0
Herb Stratum				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Equisetum fluviale</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Chamerion angustifolia</u>	<u>1</u>	_____	<u>FACU</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
3. <u>Sanguisorba canadensis</u>	<u>5</u>	_____	<u>FACW</u>	
4. <u>Rubus chamaemorus</u>	<u>3</u>	_____	<u>FACW</u>	
5. <u>Agrostis gigantea</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
6. <u>Carex canescens</u>	<u>5</u>	_____	<u>FACW</u>	
7. <u>Carex lasiocarpa</u>	<u>5</u>	_____	<u>OBL</u>	
8. <u>Calamagrostis canadensis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>69</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>34.5</u> 20% of total cover: <u>13.8</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>80</u>				
(Where applicable)				
Remarks: <u>collected Salix sp.</u>				
<u>photos 8195 - 3198</u>				

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- \_\_\_ Alaska Gleyed Without Hue 5Y or Redder  
Underlying Layer  
Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No       

Remarks:

### Wetland Hydrology Indicators:

**Primary Indicators (any one indicator is sufficient)**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Surface Water (A1)    | <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |
| <input checked="" type="checkbox"/> Saturation (A3)       | <input type="checkbox"/> Marl Deposits (B15)                       |
| <input checked="" type="checkbox"/> Water Marks (B1)      | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                |
| <input type="checkbox"/> Sediment Deposits (B2)           | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Drift Deposits (B3)              | <input type="checkbox"/> Other (Explain in Remarks)                |
| <input type="checkbox"/> Algal Mat or Crust (B4)          |  |
| <input type="checkbox"/> Iron Deposits (B5)               |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)         |  |

**Secondary Indicators (2 or more required)**

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

### Field Observations:

Surface Water Present? Yes X No      Depth (inches): 0

Water Table Present? Yes X No      Depth (Inches):     0    

Saturation Present? Yes X No      Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes X No     

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-21-13  
 Applicant/Owner: Kenai Hydro Sampling Point: high point  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): high point between stream channels  
 Local relief (concave, convex, none): convex Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.457146 Long: -149.352846 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEM/SSIC 4  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) upland mosaic  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil Yes, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u>*</u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>photos: 3225-3228 This is a pt. to help define the topo high &amp; topo low areas in a complex riparian area</u>		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula papyrifera</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
Total Cover: <u>20</u> 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				Total % Cover of: _____ Multiply by: _____
Sapling/Shrub Stratum				OBL species <u>0</u> x 1 = <u>0</u>
1. <u>Picea glauca</u>	<u>5</u>	_____	<u>FACU</u>	FACW species <u>0</u> x 2 = <u>0</u>
2. <u>Viburnum edule</u>	<u>5</u>	_____	<u>FACU</u>	FAC species <u>15</u> x 3 = <u>45</u>
3. <u>Rosa acicularis</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	FACU species <u>90</u> x 4 = <u>360</u>
4. <u>Rubus idaeus</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	UPL species <u>0</u> x 5 = <u>0</u>
5. _____	_____	_____	_____	Column Totals: <u>105</u> (A) <u>405</u> (B)
6. _____	_____	_____	_____	Prevalence Index = B/A = <u>3.86</u>
Total Cover: <u>30</u> 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				Hydrophytic Vegetation Indicators:
Herb Stratum				— Dominance Test is >50% <u>yes for topo low</u>
1. <u>Heracleum maximum</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	— Prevalence Index is ≤3.0 <u>No for topo low</u>
2. <u>Chamerion angustifolia</u>	<u>5</u>	_____	<u>FACU</u>	— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
3. <u>Cornus canadensis</u>	<u>3</u>	_____	<u>FACU</u>	— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. <u>Equisetum arvense</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Geranium erianthum</u>	<u>3</u>	_____	<u>FACU</u>	
6. <u>Gymnocarpium dryopteris</u>	<u>3</u>	_____	<u>FACU</u>	
7. <u>Dryopteris expansa</u>	<u>3</u>	_____	<u>FACU</u>	
8. <u>Agrostis gigantea</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	
9. <u>Streptopus amplexifolius</u>	<u>3</u>	_____	<u>FACU</u>	
10. <u>Aconitum delphinifolium</u>	<u>1</u>	_____	<u>FAC</u>	
Total Cover: <u>56</u> 50% of total cover: <u>27.6</u> 20% of total cover: <u>11</u>				* <u>No for topo highs, but yes for topo lows</u>
Plot size (radius, or length x width) <u>15' rad.</u> % Bare Ground <u>0</u>				Hydrophytic Vegetation Present? Yes _____ No <u>*</u>
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>10</u> (Where applicable)				

Remarks: low topo. areas: Equ. arv. & Agr. gr. dominate, other species are sim. to  
topo high areas (species list above) photos (low): 3229

Estimate 20% wetland / 80% upland in mosaic

photos (high): 3225-28

## SOIL

Sampling Point: DP23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>0-14</u>								<u>organics: bark, roots, old logs</u>
<u>14+</u>								<u>(very little silt mixed in)</u>
								<u>small cobble + gravel</u>

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  
☒ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

## Remarks:

soils are problematic  
 active floodplain area between two channels  
 some areas w/ little to no organic above gravel, this pit had more (14")

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)  
☒ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 9"  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 4"  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

yes - hydro present for topo low areas  
 No - hydro not present for topo high areas

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-22-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP24  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): riparian  
 Local relief (concave, convex, none): concave Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.456083 Long: -149.358997 Datum: NAD83  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: P6A/SSC P55/P6M  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) upland mosaic  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil PS, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>pt. taken at backwater eddy to document continued wetland / upland riparian mosaic of alder / cottonwood - spruce</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				Total % Cover of:
50% of total cover: _____ 20% of total cover: _____				OBL species <u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>0</u> x 2 = <u>0</u>
1. <u>Alnus viridis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>126</u> x 3 = <u>378</u>
2. <u>Salix commutata</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>1</u> x 4 = <u>4</u>
3. _____				UPL species <u>0</u> x 5 = <u>0</u>
4. _____				Column Totals: <u>127</u> (A) <u>382</u> (B)
5. _____				Prevalence Index = B/A = <u>3.01</u>
6. _____				Hydrophytic Vegetation Indicators:
Total Cover: <u>70</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>				Prevalence Index is ≤3.0
Herb Stratum				Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Agrostis gigantea</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Aconitum delphinifolium</u>	<u>1</u>		<u>FAC</u>	
3. <u>Athyrium filix-femina</u>	<u>5</u>		<u>FAC</u>	
4. <u>Aquilegia formosa</u> (columbine)	<u>1</u>		<u>FACU</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>57</u>				
50% of total cover: <u>28.5</u> 20% of total cover: <u>11.4</u>				
Plot size (radius, or length x width) <u>5' rad.</u> % Bare Ground <u>10 H<sub>2</sub>O open</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u>				
(Where applicable)				

Remarks: high topo areas: ~~Agrostis~~ Popu. bals., Alnu. virid., + Oplo. harr. dominate + Vibi. edul.  
estimated 10% wetlands + 90% uplands in mosaic photos 113-117





## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7.22.13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP25  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): riparian depression  
 Local relief (concave, convex, none): convex Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.4571640 Long: -149.3162162 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEM/SSIC  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.) PEMIC  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>pt represents low lying areas @ confluence of Grant crk &amp; trail crk on N. side of the Grant crk channel</u>		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
Total Cover: _____ 50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 ____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>Salix barclayi</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Salix commutata</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
6. _____				
Total Cover: <u>10</u> 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Sagittaria canadensis</u>	<u>3</u>		<u>FACW</u>	
2. <u>Equisetum arvense</u>	<u>10</u>		<u>FAC</u>	
3. <u>Carex sitchensis</u> (agrostis spp.)	<u>10</u>		<u>OBL</u>	
4. <u>Agrostis stolonifera</u>				
5. <u>Streptopus amplexifolius</u>	<u>2</u>		<u>FACU</u>	
6. <u>Calamagrostis canadensis</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>65</u> 50% of total cover: <u>32.5</u> 20% of total cover: <u>13</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>25 open</u> % Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>10</u> (Where applicable)				
Remarks: <u>photos 129-131, 132</u>				

Hydrophytic  
Vegetation  
Present? Yes X No \_\_\_\_\_



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-22-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP26  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.):  
 Local relief (concave, convex, none): None Slope (%): 0  
 Subregion: Lat: 60.457666 Long: -149.361931 Datum:  
 Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)  
 Are Vegetation, Soil, or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes X No  
 Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes	No <u>X</u>
Hydric Soil Present?	Yes	No <u>X</u>			
Wetland Hydrology Present?	Yes	No <u>X</u>			
Remarks: <u>Representative of cottonwood / Spruce photos 134-138</u> <u>upland in the riparian area.</u>					

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Populus balsamifera</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Betula papyrifera</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>14</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: <u>50</u>				Total % Cover of: _____ Multiply by:
50% of total cover: <u>25</u>				OBL species <u>0</u> x 1 = <u>0</u>
20% of total cover: <u>10</u>				FACW species <u>3</u> x 2 = <u>6</u>
Sapling/Shrub Stratum				FAC species <u>20</u> x 3 = <u>60</u>
1. <u>Viburnum edule</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	FACU species <u>131</u> x 4 = <u>524</u>
2. <u>Rosa acicularis</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	UPL species <u>0</u> x 5 = <u>0</u>
3. <u>Picea glauca</u>	<u>105</u>		<u>FACU</u>	Column Totals: <u>154</u> (A) <u>590</u> (B)
4. <u>Alnus viridis</u>	<u>45</u>		<u>FAC</u>	Prevalence Index = B/A = <u>3.83</u>
5. _____				Hydrophytic Vegetation Indicators:
6. _____				— Dominance Test is >50%
Total Cover: <u>60</u>				— Prevalence Index is ≤3.0
50% of total cover: <u>30</u>				— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
20% of total cover: <u>12</u>				— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Herb Stratum				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>Chamerion angustifolium</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
2. <u>Cymnocarpium dryopteris</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Equisetum arvense</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
4. <u>Cornus canadensis</u>	<u>5</u>		<u>FACU</u>	
5. <u>Gallium triflorum</u>	<u>3</u>		<u>FACU</u>	
6. <u>Streptopus amplexifolius</u>	<u>1</u>		<u>FACU</u>	
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>44</u>				
50% of total cover: <u>22</u>				
20% of total cover: <u>8.8</u>				
Plot size (radius, or length x width) <u>20' rad.</u>			% Bare Ground <u>0</u>	
% Cover of Wetland Bryophytes _____			Total Cover of Bryophytes <u>10</u>	
Remarks: <u>photos: 133-138</u>				

## SOIL

Sampling Point: DP26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10							silt loam w/ organics very dry	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
☐ Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: cobble / bedrockDepth (inches): 10"Hydric Soil Present? Yes ☐ No ☒

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
 (Includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Co Lake Borough/City: Moose Pass Sampling Date: 7-23-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP27  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge  
 Local relief (concave, convex, none): none Slope (%): 2  
 Subregion: \_\_\_\_\_ Lat: 60.474799 Long: -149.205864 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: P5M1E  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? N Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? N (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>Herbaceous wetland fringe on lake</u>		

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
Total Cover: _____ 50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u>X</u> Prevalence Index is ≤3.0 _____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. <u>Alnus viridis</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Salix barclayi</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	
3. _____				
4. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____				
6. _____				
7. _____				
Total Cover: <u>7</u> 50% of total cover: <u>3.5</u> 20% of total cover: <u>1.4</u>				
Herb Stratum				
1. <u>Equisetum fluviatile</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Equisetum arvense</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Carex aquatilis</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
4. <u>Deschampsia caespitosa</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Sanguisorba canadensis</u>	<u>15</u>		<u>FACW</u>	
6. <u>Aquilegia formosa</u>	<u>7</u>		<u>FACU</u>	
7. <u>Chamaenerion angustifolia</u>	<u>2</u>		<u>FACU</u>	
8. _____				
9. _____				
10. _____				
Total Cover: <u>124</u> 50% of total cover: <u>62</u> 20% of total cover: <u>24.8</u>				
Plot size (radius, or length x width) <u>20' x 3'</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>50</u>				
Remarks: <u>photos: 235-236</u>				

## SOIL

Sampling Point: DP 27

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
	Color (molst)	%	Color (molst)	%				
							gravel + cobble	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  
☒ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

## Remarks:

plot ~1' above lake level

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)  
☒ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 0  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 0  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-23-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP28  
 Investigator(s): P. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): ~10 ft above lake edge  
 Local relief (concave, convex, none): none Slope (%): 5  
 Subregion: \_\_\_\_\_ Lat: 60.474815 Long: -149.205666 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: <u>Elevated alder / birch community photos 237-239</u> <u>too high above lake to have hydrology.</u>		

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>66</u> (A/B)
4. _____				Prevalence Index worksheet:	
Total Cover: _____				Total % Cover of:	Multiply by:
50% of total cover: _____ 20% of total cover: _____				OBL species	<u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species	<u>0</u> x 2 = <u>0</u>
1. <u>Amus. vir.</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	FAC species	<u>100</u> x 3 = <u>300</u>
2. <u>Ribes idaeus</u> (raspberry)	<u>5</u>		<u>FACU</u>	FACU species	<u>55</u> x 4 = <u>220</u>
3. _____				UPL species	<u>0</u> x 5 = <u>0</u>
4. _____				Column Totals:	<u>155</u> (A) <u>520</u> (B)
5. _____				Prevalence Index = B/A = <u>3.35</u>	
6. _____				Hydrophytic Vegetation Indicators:	
Total Cover: <u>75</u>				<u>X</u> Dominance Test is >50%	
50% of total cover: <u>37.5</u> 20% of total cover: <u>15</u>				____ Prevalence Index is ≤3.0	
Herb Stratum				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
1. <u>Cha. angustifolia</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
2. <u>Hera. maximum</u>	<u>10</u>		<u>FACU</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
3. <u><del>Asclepias</del></u>	<u>5</u>				
4. <u>Egu. arvense</u>	<u>10</u>		<u>FAC</u>		
5. <u>Agros. stolon. cal. canadensis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>		
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
Total Cover: <u>80</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>					
Plot size (radius, or length x width) <u>10' x 10'</u> % Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>10</u>					
(Where applicable)					
Remarks: <u>photos 237-239</u>					

## SOIL

Sampling Point: DP28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
	No pit							
	all cobble							

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
 Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
(includes capillary fringe)Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: community elevated above lake, no hydrology.



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: MOUSE PASS Sampling Date: 7-24-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP29  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge  
 Local relief (concave, convex, none): none Slope (%): 2  
 Subregion: \_\_\_\_\_ Lat: 62.489581 Long: -149.293042 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEM1SS1E  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.) PSI/GMIE  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_ LS  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>Wetland fringe community on lakeshore photos 258-259</u>	

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)
4. _____				
Total Cover: _____				
50% of total cover: _____				
20% of total cover: _____				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Alnus viridis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. _____	<u>30</u>			OBL species <u>15</u> x 1 = <u>15</u>
3. <u>Herb Stratum</u>	<u>15</u>	<u>20%</u>	<u>6</u>	FACW species <u>12</u> x 2 = <u>24</u>
4. _____				FAC species <u>67</u> x 3 = <u>201</u>
5. <u>Agrostis scabra</u>	<u>5</u>		<u>FAC</u>	FACU species <u>12</u> x 4 = <u>48</u>
6. <u>Agrostis stolonifera</u>	<u>5</u>		<u>FAC</u>	UPL species <u>5</u> x 5 = <u>25</u>
7. <u>Calamagrostis canadensis</u>				Column Totals: <u>111</u> (A) <u>313</u> (B)
Total Cover: _____				Prevalence Index = B/A = <u>2.82</u>
50% of total cover: _____				
20% of total cover: _____				
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Utricularia dioica</u> (nuttle)	<u>2</u>		<u>FACU</u>	
2. <u>Epilobium ciliatum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Equisetum arvense</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. <u>Sanguisorba canadensis</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. <u>Mimulus guttatus</u> (monkey)	<u>10</u>	<u>Y</u>	<u>OBL</u>	
6. <u>Carex aquatilis</u>	<u>5</u>		<u>OBL</u>	
7. <u>Angelica geniflexa</u>	<u>2</u>		<u>FACW</u>	
8. <u>Arenca dioica</u> (goatsbeard)	<u>5</u>		<u>UPL</u>	
9. <u>Tellima grandiflora</u> (frangep)	<u>10</u>	<u>Y</u>	<u>FACU</u>	
10. <u>Aconitum delphinifolium</u>	<u>2</u>		<u>FAC</u>	
Total Cover: <u>81</u>				
50% of total cover: <u>40.5</u>				
20% of total cover: <u>16.2</u>				
Plot size (radius, or length x width) <u>10' X 10'</u>		% Bare Ground <u>5</u>		Hydrophytic Vegetation Present? Yes <u>X</u> No _____
% Cover of Wetland Bryophytes _____	Total Cover of Bryophytes <u>0</u>			
Remarks: <u>overhanging Alnus viridis not included photos: 258-259</u>				

## SOIL

Sampling Point: DP29

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
	No pit							
	lake edge w/ standing water							

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer  
☒ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

## Remarks:

lake edge, large cobble & gravels  
driftwood debris & alder detritus

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)  
☒ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 0  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 0  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-24-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 30  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): debris terrace  
 Local relief (concave, convex, none): convex Slope (%): 1  
 Subregion: \_\_\_\_\_ Lat: 60.489488 Long: -149.292538 Datum: \_\_\_\_\_  
 Soil Map Unit Name: colluvial soil deposit NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: <u>Pt taken adjacent to DP2A wetlands. Upland</u> <u>pt taken in moister part of this wetland, adjacent to a small drainage</u> <u>photos 260-265</u>			

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea glauca</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Populus balsamifera</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>45</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>78</u> x 3 = <u>234</u> FACU species <u>98</u> x 4 = <u>392</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>176</u> (A) <u>626</u> (B)  Prevalence Index = B/A = <u>3.56</u>
50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				
Sapling/Shrub Stratum 1. <u>Ahus viridis</u> <u>15</u> <u>Y</u> <u>FAC</u> 2. <u>Populus balsamifera</u> <u>30</u> <u>Y</u> <u>FACU</u> 3. _____ 4. _____ 5. _____ 6. _____				
Total Cover: <u>45</u>				
50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				Hydrophytic Vegetation Indicators: _____ Dominance Test is >50% _____ Prevalence Index is ≤3.0 _____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Herb Stratum 1. <u>Oplopanax horridus</u> <u>20</u> <u>Y</u> <u>FACU</u> 2. <u>Aconitum delphinifolium</u> <u>3</u> _____ <u>FAC</u> 3. <u>Equisetum arvense</u> <u>40</u> <u>Y</u> <u>FAC</u> 4. <u>Athyrium filix-femina</u> <u>10</u> _____ <u>FAC</u> 5. <u>Agrostis sp.</u> <u>10</u> _____ <u>FAC</u> 6. <u>Gymnocar. dryopteris</u> <u>3</u> _____ <u>FACU</u> 7. <u>Calamagrostis canadensis</u> <u>10</u> _____ <u>FAC</u> 8. _____ 9. _____ 10. _____				
Total Cover: <u>86</u>				
50% of total cover: <u>43</u> 20% of total cover: <u>17.2</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>5</u> % Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u> (Where applicable)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
Remarks: <u>photos: 260-265</u>				

## SOIL

Sampling Point: NP30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Texture	Remarks	
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			Loc <sup>2</sup>
0-2							Organics	
2-10	10 YR 2/1						silt loam	
10-15	10 YR 2/1	10%	gray	90%			silt loam + gravel	
15+							gravels	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) <sup>4</sup>	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder Underlying Layer	
<input type="checkbox"/> Histio Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue		
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)		<sup>3</sup> One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Redox (A14)		<sup>4</sup> Give details of color change in Remarks.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)			

Restrictive Layer (if present): Type: <u>None found</u> Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
---	--

Remarks:

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (any one indicator is sufficient)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:		Wetland Hydrology Present? Yes _____ No <u>X</u>
Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Water Table Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Saturation Present? Yes <u>X</u> No _____	Depth (inches): <u>15"</u>	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: * saturation deeper than 12", small drainage ~4' away from plot, wetter in this plot than surrounding uplands		

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Lake Borough/City: Moose Pass Sampling Date: 7-24-13  
 Applicant/Owner: Kinai Hydro Sampling Point: DP31  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge  
 Local relief (concave, convex, none): none Slope (%): 0 historic lake outlet.  
 Subregion: \_\_\_\_\_ Lat: 60.477632 Long: -149.334732 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PSS/EM1E  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? NO (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>Salix/carex-agrostis wetland @ historic lake outlet photos 280-284</u>		

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				Total % Cover of: _____ Multiply by: _____
50% of total cover: _____ 20% of total cover: _____				OBL species <u>25</u> x 1 = <u>25</u>
Sapling/Shrub Stratum				FACW species <u>5</u> x 2 = <u>10</u>
1. <u>Alnus viridis</u>	<u>5</u>		<u>FAC</u>	FAC species <u>70</u> x 3 = <u>210</u>
2. <u>Salix barclayi</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>15</u> x 4 = <u>60</u>
3. <u>Betula glandulosa</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	UPL species <u>0</u> x 5 = <u>0</u>
4. <u>Betula papyrifera</u>	<u>5</u>		<u>FACU</u>	Column Totals: <u>115</u> (A) <u>305</u> (B)
5. <u>Picea glauca</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index = B/A = <u>2.65</u>
6. _____				Hydrophytic Vegetation Indicators:
Total Cover: <u>40</u>				<u>X</u> Dominance Test is >50%
50% of total cover: <u>20</u> 20% of total cover: <u>8</u>				<u>X</u> Prevalence Index is ≤3.0
Herb Stratum				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
1. <u>Sagittaria canadensis</u>	<u>5</u>		<u>FACW</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Equisetum arvense</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Comarum palustre</u>	<u>10</u>		<u>OBL</u>	
4. <u>Plantago patula</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Agrostis stolonifera</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
6. <u>Carex aquatilis</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>	
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>75</u>				
50% of total cover: <u>37.5</u> 20% of total cover: <u>15</u>				
Plot size (radius, or length x width) <u>40' x 5'</u> % Bare Ground <u>10</u> <u>open</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>10</u> <u>H<sub>2</sub>O</u>				
(Where applicable)				
Remarks: <u>photo: 280-284</u>				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-14-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP32  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside above lake edge ~10'  
 Local relief (concave, convex, none): None Slope (%): 5  
 Subregion: \_\_\_\_\_ Lat: 60.477310 Long: -149.334804 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes <u>X</u> No <u>X</u>	
Wetland Hydrology Present?	Yes <u>X</u> No <u>X</u>	

Remarks: White spruce / Hemlock + emp. nrg. community  
w/ a distinct mpo break between wetland @ DP31 + this pt. + surrounding upland  
photos 285 - 293

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Tsuga mertensiana</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Picea glauca</u>	<u>5</u>		<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: <u>35</u>	50% of total cover: <u>17.5</u>	20% of total cover: <u>7</u>		
Sapling/Shrub Stratum				Total % Cover of: _____ Multiply by: _____
1. <u>Empetrum nigrum</u>	<u>75</u>	<u>Y</u>	<u>FAC</u>	OBL species <u>0</u> x 1 = <u>0</u>
2. <u>Ledum decumbens</u>	<u>20</u>		<u>FAC</u>	FACW species <u>0</u> x 2 = <u>0</u>
3. <u>Vaccinium uliginosum</u>	<u>5</u>		<u>FAC</u>	FAC species <u>150</u> x 3 = <u>450</u>
4. <u>Betula glandulosa</u>	<u>10</u>		<u>FAC</u>	FACU species <u>5</u> x 4 = <u>20</u>
5. <u>Tsuga mertensiana</u>	<u>10</u>		<u>FAC</u>	UPL species <u>2</u> x 5 = <u>10</u>
6. <u>Arctostaphylos uva-ursi</u>	<u>2</u>		<u>UPL</u>	Column Totals: <u>157</u> (A) <u>480</u> (B)
Total Cover: <u>122</u>				Prevalence Index = B/A = <u>3.06</u>
50% of total cover: <u>61</u> 20% of total cover: <u>24.4</u>				Hydrophytic Vegetation Indicators:
Herb Stratum				
1. <u>None</u>				<u>X</u> Dominance Test is >50%
2. _____				Prevalence Index is ≤3.0
3. _____				Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. _____				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. _____				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. _____				
7. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
8. _____				
9. _____				
10. _____				
Total Cover: _____				
50% of total cover: _____ 20% of total cover: _____				
Plot size (radius, or length x width) <u>20' radius</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>50</u>				
(Where applicable)				
Remarks:				

## SOIL

Sampling Point: DP32

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
<u>0-7</u>							<u>moss live organics</u>
<u>7-82</u>	<u>7.5 YR 2.5/2</u>	<u>100</u>					<u>silt loam</u>
<u>82-17</u>	<u>7.5 YR 4/3</u>	<u>100</u>					<u>silt loam</u>

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

☐ Histosol or Histel (A1) ☐ Alaska Color Change (TA4)<sup>4</sup> ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer

☐ Histic Epipedon (A2) ☐ Alaska Alpine Swales (TA5) ☐ Other (Explain in Remarks)

☐ Hydrogen Sulfide (A4) ☐ Alaska Redox With 2.5Y Hue

☐ Thick Dark Surface (A12)

☐ Alaska Gleyed (A13) <sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

☐ Alaska Redox (A14) <sup>4</sup>Give details of color change in Remarks.

☐ Alaska Gleyed Pores (A15)

**Restrictive Layer (if present):**

Type: None found

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
<b>Primary Indicators (any one indicator is sufficient)</b>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Water Table Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u>	Depth (inches): _____	
(Includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-24-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 33  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge  
 Local relief (concave, convex, none): none Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.485515 Long: -149.300783 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEM1H  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: <u>Carex dominated wetlands w/ standing photos 304 - 308</u> <u>H<sub>2</sub>O</u>			

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				
50% of total cover: _____ 20% of total cover: _____				
Total Cover: <u>12</u>				
Sapling/Shrub Stratum				Total % Cover of:
1. <u>Betula papyrifera</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	OBL species <u>92</u> x 1 = <u>92</u>
2. <u>Salix pulchra</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	FACW species <u>12</u> x 2 = <u>24</u>
3. <u>Tsuga mertensiana</u>	<u>1</u>		<u>FAC</u>	FAC species <u>16</u> x 3 = <u>48</u>
4. <u>Picea glauca</u>	<u>1</u>		<u>FACW</u>	FACW species <u>6</u> x 4 = <u>24</u>
5. _____				UPL species <u>0</u> x 5 = <u>0</u>
6. _____				Column Totals: <u>126</u> (A) <u>188</u> (B)
Total Cover: <u>12</u>				Prevalence Index = B/A = <u>149</u>
50% of total cover: <u>6</u> 20% of total cover: <u>2.4</u>				Hydrophytic Vegetation Indicators:
Herb Stratum				
1. <u>Agrostis stolonifera</u> (ul. canadensis)	<u>0</u>		<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Carex utriculata</u>	<u>70</u>	<u>Y</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
3. <u>Comarostaphylos</u>	<u>20</u>		<u>OBL</u>	— Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. <u>Equisetum arvense</u>	<u>5</u>		<u>FAC</u>	— Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. <u>Sagittaria arifolia</u>	<u>5</u>		<u>FACW</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. <u>Carex muscicola</u>	<u>2</u>		<u>FACW</u>	
7. <u>Carex lasiocarpa</u>	<u>2</u>		<u>OBL</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
8. _____				
9. _____				
10. _____				
Total Cover: <u>114</u>				
50% of total cover: <u>57</u> 20% of total cover: <u>22.8</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks:				

Alaska Version 2.0

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-24-13  
 Applicant/Owner: Kenai Hydro Sampling Point: BP34  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): top of be-rock pen  
 Local relief (concave, convex, none): none Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.485733 Long: -149.300361 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: <u>white spruce / hemlock upland forest GPS 11 ph. 309-314</u>			

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Picea glauca</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:	
Total Cover: <u>40</u>				Total % Cover of:	Multiply by:
50% of total cover: <u>20</u> 20% of total cover: <u>8</u>				OBL species <u>0</u>	x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>5</u>	x 2 = <u>10</u>
1. <u>Picea glauca</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	FAC species <u>20</u>	x 3 = <u>60</u>
2. <u>Tsuga mertensiana</u>	<u>10</u>	_____	<u>FAC</u>	FACU species <u>93</u>	x 4 = <u>372</u>
3. <u>Myrica asperifolia</u>	<u>3</u>	_____	<u>FACU</u>	UPL species <u>0</u>	x 5 = <u>0</u>
4. _____	_____	_____	_____	Column Totals:	<u>118</u> (A) <u>442</u> (B)
5. _____	_____	_____	_____	Prevalence Index = B/A = <u>3.75</u>	
6. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:	
Total Cover: <u>53</u>				<u>X</u> Dominance Test is >50%	
50% of total cover: <u>26.5</u> 20% of total cover: <u>10.6</u>				_____ Prevalence Index is ≤3.0	
Herb Stratum				_____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
1. <u>Cornus canadensis</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
2. <u>Rubus chamaemorus</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
3. <u>Equisetum sylvaticum</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>		
4. <u>Equisetum arvense</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>		
5. <u>Gymnocarpium dryopteris</u>	<u>3</u>	_____	<u>FACU</u>		
6. <u>Deschampsia cespitosa expansa</u>	<u>1</u>	_____	<u>FACU</u>		
7. <u>Lycopodium clavatum</u>	<u>1</u>	_____	<u>FACU</u>		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
Total Cover: <u>25</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
50% of total cover: <u>12.5</u> 20% of total cover: <u>5</u>					
Plot size (radius, or length x width) <u>20' x 20'</u> % Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>75</u>					
(Where applicable)					
Remarks:					



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-25-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP 35  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge  
 Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion: \_\_\_\_\_ Lat: 60.460934 Long: -149.337339 Datum: PEMI/SSIE  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PEMI/SSIE  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: <u>Outlet of lake</u> <u>photos 321-323</u>	

**VEGETATION** – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____	50% of total cover: _____	20% of total cover: _____		Total % Cover of: _____ Multiply by: _____
Sapling/Shrub Stratum				OBL species <u>97</u> x 1 = <u>97</u>
1. <u>Dasiphora fruticosa</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FACW species <u>7</u> x 2 = <u>14</u>
2. <u>Picea glauca</u>	<u>2</u>		<u>FACU</u>	FAC species <u>23</u> x 3 = <u>69</u>
3. <u>Alnus viridis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>7</u> x 4 = <u>28</u>
4. <u>Vaccinium uliginosum</u>	<u>3</u>		<u>FAC</u>	UPL species <u>0</u> x 5 = <u>0</u>
5. <u>Betula glandulosa</u>	<u>5</u>		<u>FACU</u>	Column Totals: <u>134</u> (A) <u>208</u> (B)
6. <u>Andromeda polifolia</u>	<u>5</u>		<u>FACW</u>	Prevalence Index = B/A = <u>1.55</u>
Total Cover: <u>35</u>	50% of total cover: <u>17.5</u>	20% of total cover: <u>7</u>		Hydrophytic Vegetation Indicators:
Herb Stratum				<u>X</u> Dominance Test is >50%
1. <u>Eriophorum chamissonis</u>	<u>40</u>	<u>Y</u>	<u>OBL</u>	<u>X</u> Prevalence Index is ≤3.0
2. <u>Carex aquatilis</u>	<u>40</u>	<u>Y</u>	<u>OBL</u>	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
3. <u>Equisetum fluviale</u>	<u>5</u>		<u>OBL</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. <u>Carex echinata</u> <u>xt</u>	<u>5</u>		<u>OBL</u>	
5. <u>Sanguisorba canadensis</u>	<u>1</u>		<u>FACW</u>	
6. <u>Carex leptalea</u> <u>g</u>	<u>5</u>		<u>OBL</u>	
7. <u>Drosera rotundifolia</u>	<u>2</u>		<u>OBL</u>	
8. <u>Swertia perennis</u>	<u>1</u>		<u>FACW</u>	
9. _____				
10. _____				
Total Cover: <u>99</u>	50% of total cover: <u>49.5</u>	20% of total cover: <u>19.8</u>		Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Plot size (radius, or length x width) <u>30 x 20</u>	% Bare Ground <u>5 open</u>			
% Cover of Wetland Bryophytes _____	Total Cover of Bryophytes <u>50</u>			
Remarks: <u>kept as PGM dominant for this polygon b/c shrubs often shorter than herbaceous; portions of polygon are SS dominated</u>				

**SOIL**Sampling Point: DP35

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
	No pit standing water in plot							

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
☐ Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

**Restrictive Layer (If present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

**HYDROLOGY****Wetland Hydrology Indicators:****Primary Indicators (any one indicator is sufficient)**

- ☒ Surface Water (A1)  
☒ High Water Table (A2)  
☒ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)  
☐ Marl Deposits (B15)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Dry-Season Water Table (C2)  
☐ Other (Explain in Remarks)

**Secondary Indicators (2 or more required)**

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☒ No ☐ Depth (inches): 0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 0  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 0  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-25-13  
 Applicant/Owner: Keneu Hydro Sampling Point: DP36 + DP38  
 Investigator(s): C. Schwab J. Blank Landform (hillside, terrace, hummocks, etc.): hillside above lake edge  
 Local relief (concave, convex, none): none Slope (%): 5  
 Subregion: \_\_\_\_\_ Lat: 60.4161084 Long: -149.331449 Datum: \_\_\_\_\_  
 Soil Map Unit Name: DP38: 60.459607 NW classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: <u>The community documented at DP36 photos 342-345 DP36 is the same community at DP38. This datasheet is representative</u>		

## VEGETATION – Use scientific names of plants. List all species in the plot. for both data point locations

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Tsuga mertensiana</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Picea glauca</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
Total Cover: <u>20</u>				Total % Cover of: _____ Multiply by: _____
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				OBL species <u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>0</u> x 2 = <u>0</u>
1. <u>Tsuga mertensiana</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>100</u> x 3 = <u>300</u>
2. <u>Picea glauca</u>	<u>10</u>	_____	<u>FACU</u>	FACU species <u>18</u> x 4 = <u>72</u>
3. <u>ledum decumbens</u>	<u>10</u>	_____	<u>FAC</u>	UPL species <u>5</u> x 5 = <u>25</u>
4. <u>Vaccinium uliginosum</u>	<u>15</u>	_____	<u>FAC</u>	Column Totals: <u>123</u> (A) <u>397</u> (B)
5. <u>Empetrum nigrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index = B/A = <u>3.23</u>
6. <u>Arctostaphylos uva-ursi</u>	<u>5</u>	_____	<u>UPL</u>	
<u>Geocaulon medium</u>	<u>3</u>	_____	<u>FACU</u>	
Total Cover: <u>103</u>				
50% of total cover: <u>51.5</u> 20% of total cover: <u>20.6</u>				
Herb Stratum				Hydrophytic Vegetation Indicators:
1. <u>None</u>	_____	_____	_____	<u>X</u> Dominance Test is >50%
2. _____	_____	_____	_____	Prevalence Index is ≤3.0
3. _____	_____	_____	_____	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. _____	_____	_____	_____	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: _____				
50% of total cover: _____ 20% of total cover: _____				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>5</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u>				
(Where applicable)				
Remarks:				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

## SOIL

Sampling Point: DP36 + DP38

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
0-6							Moss + roots organics
6-7	2.5Y 8/2	50%	7.5YR 2.5/3	50%	C	M	silt
7-16	10YR 4/4	100					silt/clam

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) <sup>4</sup>	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	
<input type="checkbox"/> Thick Dark Surface (A12)		
<input type="checkbox"/> Alaska Gleyed (A13)	<sup>3</sup> One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.	
<input type="checkbox"/> Alaska Redox (A14)	<sup>4</sup> Give details of color change in Remarks.	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		

Restrictive Layer (if present):  
 Type: none found  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (any one indicator is sufficient)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present?
Surface Water Present?	Yes _____ No <u>X</u> Depth (inches): _____	Yes _____ No <u>X</u>
Water Table Present?	Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No <u>X</u> Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-25-13  
 Applicant/Owner: Kenau Hydro Sampling Point: DP37  
 Investigator(s): C. Schwedel J. Blank Landform (hillside, terrace, hummocks, etc.): swale  
 Local relief (concave, convex, none): convex Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.459557 Long: -149.337481 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: PFO4B/POM1B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_. (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_.  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: <u>marginal forested wetland in moist drainage photos 362-366</u> <u>Same location as HDR's 2010 pt #10.</u>			

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Tsuga mertensiana</u>	<u>75</u>	<u>Y</u>	<u>FAC</u>		Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)	
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (AB)	
4. _____	_____	_____	_____	Prevalence Index worksheet:	
Total Cover: <u>75</u>					Total % Cover of: _____ Multiply by: _____
50% of total cover: <u>37.5</u> 20% of total cover: <u>15</u>					OBL species <u>0</u> x 1 = <u>0</u>
Sapling/Shrub Stratum				FACW species <u>30</u> x 2 = <u>60</u>	
1. <u>Tsuga mertensiana</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>95</u> x 3 = <u>285</u>	
2. <u>Viburnum edule</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>23</u> x 4 = <u>92</u>	
3. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>	
4. _____	_____	_____	_____	Column Totals: <u>148</u> (A) <u>437</u> (B)	
5. _____	_____	_____	_____	Prevalence Index = B/A = <u>2.95</u>	
6. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:	
Total Cover: <u>15</u>					<u>X</u> Dominance Test is >50%
50% of total cover: <u>7.5</u> 20% of total cover: <u>3</u>					<u>X</u> Prevalence Index is ≤3.0
Herb Stratum				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
1. <u>Rubus chamaemorus</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
2. <u>Streptopus amplexifolius</u>	<u>3</u>	_____	<u>FACU</u>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
3. <u>Opiopanax horridus</u>	<u>5</u>	_____	<u>FACU</u>		
4. <u>Vaccinium ovadifolium</u>	<u>5</u>	_____	<u>FAC</u>		
5. <u>Cornus canadensis</u>	<u>10</u>	_____	<u>FACU</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
6. <u>Lycopodium clavatum</u>	<u>5</u>	_____	<u>FACU</u>		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____	Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>	
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
Total Cover: <u>58</u>				% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>90</u>	
50% of total cover: <u>29</u> 20% of total cover: <u>11.6</u>				Remarks:	

## SOIL

Sampling Point: DP 37

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>0-3</u>							<u>mass - live organics</u>	
<u>3-9</u>	<u>2.5Y 4/3</u>	<u>50%</u>	<u>10YR 2/1</u>	<u>50%</u>	<u>D</u>	<u>M</u>	<u>silt &amp; roots</u>	
<u>9-16</u>	<u>10YR 2/1</u>	<u>100</u>					<u>(damp) silt &amp; roots</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

Indicators for Problematic Hydric Soils<sup>3</sup>:☒ Histosol or Histel (A1)☐ Alaska Color Change (TA4)<sup>4</sup>☐ Alaska Gleyed Without Hue 5Y or Redder☐ Histic Epipedon (A2)☐ Alaska Alpine Swales (TA5)☐ Underlying Layer☐ Hydrogen Sulfide (A4)☐ Alaska Redox With 2.5Y Hue☐ Other (Explain in Remarks)☐ Thick Dark Surface (A12)☐ Alaska Gleyed (A13)<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,☐ Alaska Redox (A14)

and an appropriate landscape position must be present unless disturbed or problematic.

☐ Alaska Gleyed Pores (A15)<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: None found

Depth (Inches): \_\_\_\_\_

Hydric Soil Present? Yes X No \_\_\_\_\_

## Remarks:

\* HDR's point 110 at this same location showed wetter soils.We are being conservative & considering this a wetland as well

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

☐ Surface Water (A1)☐ Inundation Visible on Aerial Imagery (B7)☐ High Water Table (A2)☐ Sparsely Vegetated Concave Surface (B8)☐ Saturation (A3)☐ Marl Deposits (B15)☐ Water Marks (B1)☐ Hydrogen Sulfide Odor (C1)☐ Sediment Deposits (B2)☐ Dry-Season Water Table (C2)☐ Drift Deposits (B3)☐ Other (Explain in Remarks)☐ Algal Mat or Crust (B4)☐ Iron Deposits (B5)☐ Surface Soil Cracks (B6)

## Secondary Indicators (2 or more required)

☐ Water-stained Leaves (B9)☐ Drainage Patterns (B10)☐ Oxidized Rhizospheres along Living Roots (C3)☐ Presence of Reduced Iron (C4)☐ Salt Deposits (C5)☐ Stunted or Stressed Plants (D1)☒ Geomorphic Position (D2)☐ Shallow Aquitard (D3)☒ Microtopographic Relief (D4)☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X Depth (Inches): \_\_\_\_\_Water Table Present? Yes \_\_\_\_\_ No X Depth (Inches): \_\_\_\_\_Saturation Present? Yes \_\_\_\_\_ No X Depth (Inches): \_\_\_\_\_  
(includes capillary fringe)Wetland Hydrology Present? Yes X No \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

HDR documented saturated conditions in 2010

## WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Grant Creek Corridor Borough/City: Moose Pass Sampling Date: 7-25-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP39  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): stream channel  
 Local relief (concave, convex, none): none Slope (%): 1  
 Subregion: \_\_\_\_\_ Lat: 60.459607 Long: -149.335031 Datum: \_\_\_\_\_  
 Soil Map Unit Name: 460495 NWI classification: PSS1/EM E  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: <u>p+ taken along a running tributary (235B) photos: 374, 377 to lake</u>			

## VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet:
Total Cover: _____				Total % Cover of:
50% of total cover: _____ 20% of total cover: _____				Multiply by:
Sapling/Shrub Stratum				OBL species <u>15</u> x 1 = <u>15</u>
1. <u>Salix pulchra</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	FACW species <u>35</u> x 2 = <u>70</u>
2. <u>Alnus viridis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	FAC species <u>88</u> x 3 = <u>264</u>
3. <u>Salix barclayi</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	FACU species <u>11</u> x 4 = <u>44</u>
4. <u>Picea glauca</u>	<u>1</u>		<u>FACU</u>	UPL species <u>0</u> x 5 = <u>0</u>
5. _____				Column Totals: <u>149</u> (A) <u>393</u> (B)
6. _____				Prevalence Index = B/A = <u>2.64</u>
Total Cover: <u>76</u>				Hydrophytic Vegetation Indicators:
50% of total cover: <u>38</u> 20% of total cover: <u>15.2</u>				<u>X</u> Dominance Test is >50%
Herb Stratum				<u>X</u> Prevalence Index is ≤3.0
1. <u>Sanguisorba canadensis</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>	____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
2. <u>Equisetum fluviatile</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>	____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
3. <u>Athyrium filix-femina</u>	<u>3</u>		<u>FAC</u>	
4. <u>Equisetum arvense</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Agrostis mertensii</u>	<u>10</u>		<u>FACU</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Cover: <u>73</u>				
50% of total cover: <u>36.5</u> 20% of total cover: <u>14.6</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>20% open</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>10</u>				
(Where applicable)				
Remarks:				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

## SOIL

Sampling Point: DP39

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
	No pit							
	flowing water in plot							

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- ☐ Histosol or Histel (A1)  
☐ Histlic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
 Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No \_\_\_\_\_

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)      ☐ Inundation Visible on Aerial Imagery (B7)  
☒ High Water Table (A2)      ☐ Sparsely Vegetated Concave Surface (B8)  
☒ Saturation (A3)      ☐ Marl Deposits (B15)  
☐ Water Marks (B1)      ☐ Hydrogen Sulfide Odor (C1)  
☐ Sediment Deposits (B2)      ☐ Dry-Season Water Table (C2)  
☐ Drift Deposits (B3)      ☐ Other (Explain in Remarks)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes X No \_\_\_\_\_ Depth (inches): 0  
 Water Table Present? Yes X No \_\_\_\_\_ Depth (inches): 0  
 Saturation Present? Yes X No \_\_\_\_\_ Depth (inches): 6  
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant Lake Borough/City: Moose Pass Sampling Date: 7-28-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP40  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): hillside  
 Local relief (concave, convex, none): none Slope (%): 3  
 Subregion: \_\_\_\_\_ Lat: 60.460442 Long: -149.335323 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? N Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? N (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks: <u>photos 378-379</u>					

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Tsuga mertensiana</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>40</u>				
50% of total cover: <u>20</u> 20% of total cover: <u>8</u>				
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Vaccinium ovalifolium</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Menziesia ferruginea</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	OBL species <u>0</u> x 1 = <u>0</u>
3. <u>Picea glauca</u>	<u>2</u>	_____	<u>FACU</u>	FACW species <u>5</u> x 2 = <u>10</u>
4. _____	_____	_____	_____	FAC species <u>63</u> x 3 = <u>189</u>
5. _____	_____	_____	_____	FACU species <u>62</u> x 4 = <u>248</u>
6. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
Total Cover: <u>42</u>				Column Totals: <u>130</u> (A) <u>447</u> (B)
50% of total cover: <u>21</u> 20% of total cover: <u>8.4</u>				Prevalence Index = B/A = <u>3.44</u>
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Equisetum sylvaticum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	<u>X</u> Dominance Test is >50%
2. <u>Rubus chamaemorus</u>	<u>5</u>	_____	<u>FACW</u>	Prevalence Index is ≤3.0
3. <u>Gymnocarpium dryopteris</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4. <u>Cornus canadensis</u>	<u>5</u>	_____	<u>FACU</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. <u>Ribes triste</u> (current)	<u>3</u>	_____	<u>FAC</u>	
6. <u>Lycopodium clavatum</u>	<u>5</u>	_____	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Total Cover: <u>48</u>				
50% of total cover: <u>24</u> 20% of total cover: <u>9.6</u>				
Plot size (radius, or length x width) <u>20' rad.</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u>				
Remarks: _____				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

## SOIL

Sampling Point: DP40

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features			Texture	Remarks	
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			Loc <sup>2</sup>
	No pit							
	too much downfall & too many large roots to dig soil pit							

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Alaska Color Change (TA4) <sup>4</sup>	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Alaska Alpine Swales (TA5)	<input type="checkbox"/> Underlying Layer	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)			
<input type="checkbox"/> Alaska Gleyed (A13)	<sup>3</sup> One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology,		
<input type="checkbox"/> Alaska Redox (A14)	and an appropriate landscape position must be present unless disturbed or problematic.		
<input type="checkbox"/> Alaska Gleyed Pores (A15)	<sup>4</sup> Give details of color change in Remarks.		

Restrictive Layer (if present):

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks: Dry upland conditions similar to previously documented upland sample locations. Assuming non-hydric soil conditions.

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
<u>Primary Indicators (any one indicator is sufficient)</u>			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Salt Deposits (C5)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes _____ No <u>X</u>	Depth (Inches): _____		
Water Table Present? Yes _____ No <u>X</u>	Depth (Inches): _____		
Saturation Present? Yes _____ No <u>X</u>	Depth (Inches): _____		
(includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

## WETLAND DETERMINATION DATA FORM - Alaska Region

Project/Site: Grant lake Borough/City: MOOSE PASS Sampling Date: 7-25-13  
 Applicant/Owner: Kenai Hydro Sampling Point: DP41  
 Investigator(s): C. Schudel J. Blank Landform (hillside, terrace, hummocks, etc.): lake edge (south)  
 Local relief (concave, convex, none): none Slope (%): 2  
 Subregion: \_\_\_\_\_ Lat: 60.460590 Long: -149.332178 Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? No Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? No (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: <u>Lake edge on south<sup>wet</sup> side of lake</u>			

## VEGETATION - Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>6</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>50</u> (A/B)
4. _____					
Total Cover: _____					
50% of total cover: _____ 20% of total cover: _____					
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. <u>P. canadensis</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of:	Multiply by:
2. <u>Salix barclayi</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	OBL species <u>0</u>	x 1 = <u>0</u>
3. <u>Rosa acicularis</u>	<u>3</u>	<u>Y</u>	<u>FACW</u>	FACW species <u>12</u>	x 2 = <u>24</u>
4. _____				FAC species <u>55</u>	x 3 = <u>165</u>
5. _____				FACU species <u>46</u>	x 4 = <u>184</u>
6. _____				UPL species <u>5</u>	x 5 = <u>25</u>
Total Cover: <u>13</u>				Column Totals:	<u>118</u> (A) <u>398</u> (B)
50% of total cover: <u>6.5</u> 20% of total cover: <u>2.6</u>				Prevalence Index = B/A = <u>3.37</u>	
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:	
1. <u>Chamaenerion angustifolium</u>	<u>10</u>		<u>FACU</u>	<u>X</u> Dominance Test is >50%	
2. <u>Achillea millefolium</u>	<u>3</u>		<u>FACU</u>	Prevalence Index is ≤3.0	
3. <u>Geranium erianthum</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>	Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
4. <u>Sanguisuga canadensis</u>	<u>10</u>		<u>FACW</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
5. <u>Equisetum arvense</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>		
6. <u>Heracleum maximum</u>	<u>10</u>		<u>FACU</u>		
7. <u>Aconitum delphinifolium</u>	<u>5</u>		<u>FAC</u>		
8. <u>Galium trifidum</u>	<u>2</u>		<u>FACW</u>		
9. <u>Aquilegia formosa</u>	<u>5</u>		<u>FACU</u>		
10. <u>Calamagrostis canadensis</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>		
Total Cover: <u>105</u>					
50% of total cover: <u>52.5</u> 20% of total cover: <u>21</u>					
Plot size (radius, or length x width) <u>20' rad</u> % Bare Ground <u>0</u>					
% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes <u>20</u>					
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____	

Remarks:

A Existing conditions = upland, but potential for narrow band of this community to meet wetland conditions w/ problematic soils during the early growing season when lake levels are higher. The sample pit is ~3 ft (vertical) above current H<sub>2</sub>O line. Wave line is ~2 vertical ft. above H<sub>2</sub>O line. Dry pit to 20" bgs - moist but not wet. Compared to the rest of the lakeshore - this area is very flat.

## SOIL

Sampling Point: DP41

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
<del>0-5</del> 0-1							organics	moss & roots
<del>3-6</del> 1-6							organics	
6-20							fine	lakeshore gravels

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Histosol or Histel (A1)  
☐ Histic Epipedon (A2)  
☐ Hydrogen Sulfide (A4)  
☐ Thick Dark Surface (A12)  
☐ Alaska Gleyed (A13)  
☐ Alaska Redox (A14)  
☐ Alaska Gleyed Pores (A15)

- ☐ Alaska Color Change (TA4)<sup>4</sup>  
☐ Alaska Alpine Swales (TA5)  
☐ Alaska Redox With 2.5Y Hue

- ☐ Alaska Gleyed Without Hue 5Y or Redder  
☐ Underlying Layer  
☐ Other (Explain in Remarks)

<sup>3</sup>One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

<sup>4</sup>Give details of color change in Remarks.

## Restrictive Layer (if present):

Type: none found

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1) ☐ Inundation Visible on Aerial Imagery (B7)  
☒ High Water Table (A2) ☐ Sparsely Vegetated Concave Surface (B8)  
☒ Saturation (A3) ☐ Marl Deposits (B15)  
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)  
☐ Sediment Deposits (B2) ☐ Dry-Season Water Table (C2)  
☐ Drift Deposits (B3) ☐ Other (Explain in Remarks)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)

## Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)  
☐ Drainage Patterns (B10)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Salt Deposits (C5)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP01

Date: 7-16-13

Wetland Type: PEM1/SS1C

Investigators: J. Blank + C. Schudel

<p><b>A. Flood Flow Alteration</b> (Storage and Desynchronization)</p> <p>1 Wetland occurs in the upper portion of its watershed.  2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.  3 Wetland is a closed (depressional) system.  4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.  5 Wetland has dense woody vegetation.  6 Wetland receives floodwater from an adjacent water course.  7 Floodwater come as sheet flow rather than channel flow.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u>  2 <u>Y</u>  3 <u>N</u>  4 <u><del>Y</del> N</u>  5 <u>N</u>  6 <u>Y</u>  7 <u>N</u></p> <p>5-7 (Y) - High Function  1-4 (Y) - Moderate Function ✓  None - Low or No Function</p>
<p><b>B. Sediment Removal</b></p> <p>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (<i>glacial till</i>)  2 Slow-moving water and/or a deepwater habitat are present in the wetland.  3 Dense herbaceous vegetation is present.  4 Inerspersion of vegetation and water is high in wetland.  5 Ponding of water is high in wetland.  6 Sediment deposits are present in wetland.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u>  2 <u>N</u>  3 <u>N</u>  4 <u>Y (portions)</u>  5 <u>N</u>  6 <u>Y</u></p> <p>4-6 (Y) - High Function  1-3 (Y) - Moderate Function ✓  None - Low or No Function</p>
<p><b>C. Nutrient and Toxicant Removal</b></p> <p>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.  2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.  3 Wetland provides long duration for water detention.  4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.  5 Fine grained mineral or organic materials are present for the wetland.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>N</u>  2 <u>Y</u>  3 <u>N</u>  4 <u>Y</u>  5 <u>Y</u></p> <p>3-5 (Y) - High Function ✓  1-2 (Y) - Moderate Function  None - Low or No Function</p>

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-16-13Wetland ID: DP01

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <ol style="list-style-type: none"> <li>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</li> <li>2 A herbaceous layer is part of this dense vegetation.</li> <li>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>N</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - <u>Low</u> or No Function ✓
<b>E. Production of Organic Matter and its Export</b> <ol style="list-style-type: none"> <li>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</li> <li>2 Woody plants in wetland are mostly deciduous.</li> <li>3 High degree of plant community structure, vegetation density, and species richness present.</li> <li>4 Interspersion of vegetation and water is high in wetland.</li> <li>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>Y</u> 6** <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b> <ol style="list-style-type: none"> <li>1 Wetland is not fragmented by development.</li> <li>2 Upland surround wetland is undeveloped.</li> <li>3 Wetland has connectivity with other habitat types.</li> <li>4 Diversity of plant species is high.</li> <li>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</li> <li>6 Has high degree of Cowardin Class interspersion</li> <li>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> ✓ 5 <u>Y</u> 6 <u>N</u> 7 <u>Y</u>  5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <ol style="list-style-type: none"> <li>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</li> <li>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</li> <li>3 Observation of fish.</li> <li>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</li> <li>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</li> <li>6 Juvenile rearing areas.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u>  1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____  4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b> <ol style="list-style-type: none"> <li>1 Dominant and codominant plants are native.</li> <li>2 Wetland contains two or more Cowardin Classes.</li> <li>3 Wetland has three or more strata of vegetation.</li> <li>4 Wetland has mature trees.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-16-13Wetland ID: DP01

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function <input checked="" type="checkbox"/> None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or <u>other features</u> that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>Y</u> <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <del>Low</del> or <del>No Function</del>
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function <input checked="" type="checkbox"/> None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP02

Date: 7-16-13

Wetland Type: PSSIE

Investigators: J. Blank C. Schudel

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>N</u>  5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function ✓ None - <del>Low</del> No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. ( <i>glacial till</i> ) 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>Y</u> 2 <u>N</u> 3 <u>N</u> 4 <u>Y</u> 5 <u>N</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>Y</u>  3-5 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-16-13Wetland ID: DP02

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i>  1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion. 2 A herbaceous layer is part of this dense vegetation. 3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and its Export</b>  1 Wetland has at least 30% aerial cover of dense herbaceous vegetation. 2 Woody plants in wetland are mostly deciduous. 3 High degree of plant community structure, vegetation density, and species richness present. 4 Interspersion of vegetation and water is high in wetland. 5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 6 Wetland has outlet from which organic matter is flushed.** **If #6 is No, then wetland automatically rated as low or No function	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>Y</u> 5 <u>Y</u> 6** <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b>  1 Wetland is not fragmented by development. 2 Upland surround wetland is undeveloped. 3 Wetland has connectivity with other habitat types. 4 Diversity of plant species is high. 5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...) 6 Has high degree of Cowardin Class interspersion 7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>N</u> 6 <u>N</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i>  1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body. 2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter. 3 Observation of fish. 4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 5 Spawning areas are present (aquatic vegetation and/or gravel beds). 6 Juvenile rearing areas.	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u>  1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____  4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b>  1 Dominant and codominant plants are native. 2 Wetland contains two or more Cowardin Classes. 3 Wetland has three or more strata of vegetation. 4 Wetland has mature trees.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>N</u> 3 <u>N</u> 4 <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-16-13Wetland ID: DP02

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b> 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <del>Low or No Function</del>
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP03

Date: 7-16-13

Wetland Type: PMS1

Investigators: J. Blank + C. Schudel

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow. <i>Channels w/ in wetland</i>	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>DN</u> 5 <u>N</u> 6 <u>Y</u> 7 <u>N</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. ( <i>glacial till</i> ) 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>N</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-16-13Wetland ID: DP 03

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function <input checked="" type="checkbox"/></p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function <input checked="" type="checkbox"/></p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>N</u> <input checked="" type="checkbox"/></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function <input checked="" type="checkbox"/></p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function <input checked="" type="checkbox"/></p> <p>None - Low or No Function</p>

Date: 7-16-13Wetland ID: DP.03

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <del>Low or No Function</del>
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP 04

Date: 7-16-13

Wetland Type: PSS1/EMIB

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul> <p style="text-align: center;"><i>channels thru wetlands</i></p>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>Y</u></td></tr> <tr><td>2</td><td><u>Y</u></td></tr> <tr><td>3</td><td><u>N</u></td></tr> <tr><td>4</td><td><u>X N</u></td></tr> <tr><td>5</td><td><u>Y</u></td></tr> <tr><td>6</td><td><u>Y</u></td></tr> <tr><td>7</td><td><u>N</u></td></tr> </table> <p>5-7 (Y) - High Function          1-4 (Y) - Moderate Function ✓          None - Low or No Function</p>	1	<u>Y</u>	2	<u>Y</u>	3	<u>N</u>	4	<u>X N</u>	5	<u>Y</u>	6	<u>Y</u>	7	<u>N</u>
1	<u>Y</u>														
2	<u>Y</u>														
3	<u>N</u>														
4	<u>X N</u>														
5	<u>Y</u>														
6	<u>Y</u>														
7	<u>N</u>														
<b>B. Sediment Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (<i>Glacial till</i>)</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>Y</u></td></tr> <tr><td>2</td><td><u>N</u></td></tr> <tr><td>3</td><td><u>X Y</u></td></tr> <tr><td>4</td><td><u>N</u></td></tr> <tr><td>5</td><td><u>N</u></td></tr> <tr><td>6</td><td><u>Y</u></td></tr> </table> <p>4-6 (Y) - High Function          1-3 (Y) - Moderate Function ✓          None - Low or No Function</p>	1	<u>Y</u>	2	<u>N</u>	3	<u>X Y</u>	4	<u>N</u>	5	<u>N</u>	6	<u>Y</u>		
1	<u>Y</u>														
2	<u>N</u>														
3	<u>X Y</u>														
4	<u>N</u>														
5	<u>N</u>														
6	<u>Y</u>														
<b>C. Nutrient and Toxicant Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>N</u></td></tr> <tr><td>2</td><td><u>Y</u></td></tr> <tr><td>3</td><td><u>Y</u></td></tr> <tr><td>4</td><td><u>Y</u></td></tr> <tr><td>5</td><td><u>Y</u></td></tr> </table> <p>3-5 (Y) - High Function ✓          1-2 (Y) - Moderate Function          None - Low or No Function</p>	1	<u>N</u>	2	<u>Y</u>	3	<u>Y</u>	4	<u>Y</u>	5	<u>Y</u>				
1	<u>N</u>														
2	<u>Y</u>														
3	<u>Y</u>														
4	<u>Y</u>														
5	<u>Y</u>														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-16-13Wetland ID: DP04

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6 <u>N</u></p> <p>7 <u>N</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-16-13Wetland ID: DP 84

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership. 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b>  1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None (Low) or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP 06

Date: 7-17-13

Wetland Type: PSS/EMIC

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul>	<b>Likely or not likely to Provide (Y or N)</b> <table border="0"> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>X N</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td>N</td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	Y	3	N	4	X N	5	Y	6	Y	7	N
1	Y														
2	Y														
3	N														
4	X N														
5	Y														
6	Y														
7	N														
<b>B. Sediment Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (glacial till)</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ul>	<b>Likely or not likely to Provide (Y or N)</b> <table border="0"> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>Y</td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	N	3	Y	4	N	5	N	6	Y		
1	Y														
2	N														
3	Y														
4	N														
5	N														
6	Y														
<b>C. Nutrient and Toxicant Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ul>	<b>Likely or not likely to Provide (Y or N)</b> <table border="0"> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	N	4	Y	5	Y				
1	N														
2	Y														
3	N														
4	Y														
5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-17-13Wetland ID: DP06

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(If associated with a watercourse or shoreline)</i> <ol style="list-style-type: none"> <li>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</li> <li>2 A herbaceous layer is part of this dense vegetation.</li> <li>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and Its Export</b> <ol style="list-style-type: none"> <li>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</li> <li>2 Woody plants in wetland are mostly deciduous.</li> <li>3 High degree of plant community structure, vegetation density, and species richness present.</li> <li>4 Interspersion of vegetation and water is high in wetland.</li> <li>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>Y</u> 5 <u>Y</u> 6** <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b> <ol style="list-style-type: none"> <li>1 Wetland is not fragmented by development.</li> <li>2 Upland surround wetland is undeveloped.</li> <li>3 Wetland has connectivity with other habitat types.</li> <li>4 Diversity of plant species is high.</li> <li>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</li> <li>6 Has high degree of Cowardin Class interspersion</li> <li>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>Y</u>  5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <ol style="list-style-type: none"> <li>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</li> <li>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</li> <li>3 Observation of fish.</li> <li>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</li> <li>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</li> <li>6 Juvenile rearing areas.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> 1 <u>X</u> 2 <u>X</u> 3 <u>X</u> 4 <u>X</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b> <ol style="list-style-type: none"> <li>1 Dominant and codominant plants are native.</li> <li>2 Wetland contains two or more Cowardin Classes.</li> <li>3 Wetland has three or more strata of vegetation.</li> <li>4 Wetland has mature trees.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-17-13Wetland ID: DP06

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.**, <u>USFS, or Audubon</u> 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1** <u>N</u> 2** <u>Y</u> <u>N</u> <u>VA TH, TOVA</u> 3 <u>N</u> <u>(USFS)</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <u>Low</u> or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP08

Date: 7-17-13

Wetland Type: PSS1/PEM1B

Investigators: J Blank &amp; Schudel

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constricted outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>Y portion</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td>Y</td></tr> </table> 5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function	1	Y	2	Y	3	N	4	N	5	Y portion	6	Y	7	Y
1	Y														
2	Y														
3	N														
4	N														
5	Y portion														
6	Y														
7	Y														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (glacial till)</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>Y</td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	N	3	N	4	N	5	N	6	Y		
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<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y portion</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y portion	3	N	4	Y	5	Y				
1	N														
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NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-17-13Wetland ID: DPO8

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and Its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u> portions</p> <p>5 <u>Y</u> portions</p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u> true</p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u> nest, tracks</p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u> (2 sticklebacks on lakeshore)</p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>NO</u></p> <p>4 <u>NO</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-17-13Wetland ID: DP08

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function

1



## Kenia Hydro, LLC - Grant Lake Project

Typical alder will be  
adj. to lake shore

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DPO9

Date: 7-17-13

PSS 1B

Wetland Type: PSS1B

Investigators: J Blank &amp; C Schudell

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td><del>Y</del> N</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td><del>N</del></td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	Y	3	N	4	<del>Y</del> N	5	Y	6	Y	7	<del>N</del>
1	Y														
2	Y														
3	N														
4	<del>Y</del> N														
5	Y														
6	Y														
7	<del>N</del>														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (glacial till)</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td><del>Y</del> N</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>Y</td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	N	3	<del>Y</del> N	4	N	5	N	6	Y		
1	Y														
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<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td><del>Y</del> N Y</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>Y</td></tr> </table> 3-5 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	<del>Y</del> N Y	4	N	5	Y				
1	N														
2	Y														
3	<del>Y</del> N Y														
4	N														
5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-17-13Wetland ID: DP 09

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i>  1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion. 2 A herbaceous layer is part of this dense vegetation. 3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and Its Export</b>  1 Wetland has at least 30% aerial cover of dense herbaceous vegetation. 2 Woody plants in wetland are mostly deciduous. 3 High degree of plant community structure, vegetation density, and species richness present. 4 Interspersion of vegetation and water is high in wetland. 5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 6 Wetland has outlet from which organic matter is flushed.** **If #6 is No, then wetland automatically rated as low or No function	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>Y</u> 6** <u>Y</u>  4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b>  1 Wetland is not fragmented by development. 2 Upland surround wetland is undeveloped. 3 Wetland has connectivity with other habitat types. 4 Diversity of plant species is high. 5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...) 6 Has high degree of Cowardin Class interspersion 7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>N</u> 6 <u>N</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i>  1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body. 2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter. 3 Observation of fish. 4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 5 Spawning areas are present (aquatic vegetation and/or gravel beds). 6 Juvenile rearing areas.	<b>Likely or not likely to Provide (Y or N)</b> <b>NA</b>  1 <u>X</u> 2 <u>X</u> 3 <u>X</u> 4 <u>X</u> 5 <u> </u> 6 <u> </u>  4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b>  1 Dominant and codominant plants are native. 2 Wetland contains two or more Cowardin Classes. 3 Wetland has three or more strata of vegetation. 4 Wetland has mature trees.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>N</u> 3 <u>N</u> 4 <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-17-13Wetland ID: DP09

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <del>Low</del> or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP10

Date: 7-17-13

Wetland Type: PEMIF

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>N</u> 6 <u>Y</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (glacial till) 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-17-13Wetland ID: DP10

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion. 2 A herbaceous layer is part of this dense vegetation. 3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p> <p><i>Becoming more of a stabilization feature, but still fairly new establishment of plants</i></p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>N</u> <del>Y</del> <i>functions</i> 2 <u>N</u> <del>Y</del> <i>partially</i> 3 <u>N</u></p> <p>2-3 (Y) - High Function 1 (Y) - Moderate Function None - <u>Low or No Function</u> ✓</p>
<p><b>E. Production of Organic Matter and its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation. 2 Woody plants in wetland are mostly deciduous. 3 High degree of plant community structure, vegetation density, and species richness present. 4 Interspersion of vegetation and water is high in wetland. 5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 6 Wetland has outlet from which organic matter is flushed.** **If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>N</u> 2 <u>N</u> 3 <u>N</u> 4 <u>Y</u> 5 <u>Y</u> 6** <u>Y</u></p> <p>4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development. 2 Upland surround wetland is undeveloped. 3 Wetland has connectivity with other habitat types. 4 Diversity of plant species is high. 5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...) 6 Has high degree of Cowardin Class interspersion 7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> ✓ 5 <u>N</u> 6 <u>N</u> 7 <u>Y</u></p> <p>5-7 (Y) - High Function ✗ 1-4 (Y) - Moderate Function ✗ None - Low or No Function</p> <p><i>Elevated to "high" b/c weighted waterfowl habitat</i></p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body. 2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter. 3 Observation of fish. 4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter. 5 Spawning areas are present (aquatic vegetation and/or gravel beds). 6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>N</u> 2 <u>N</u> 3 <u>Y</u> - small seeping area 4 <u>Y</u> - adjacent wetland 5 <u>unk</u> 6 <u>unk</u></p> <p>4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function</p> <p><i>NA</i></p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native. 2 Wetland contains two or more Cowardin Classes. 3 Wetland has three or more strata of vegetation. 4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u> 2 <u>N</u> 3 <u>N</u> 4 <u>N</u></p> <p>3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function</p>

Date: 7-17-13Wetland ID: DP10

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b>  1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP12

Date: 7-18-13

Wetland Type: PSS1/EM1E

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>  N  </u></td></tr> <tr><td>2</td><td><u>  N  </u></td></tr> <tr><td>3</td><td><u>  N  </u></td></tr> <tr><td>4</td><td><u>  N  </u></td></tr> <tr><td>5</td><td><u>  Y  </u></td></tr> <tr><td>6</td><td><u>  N  </u></td></tr> <tr><td>7</td><td><u>  N  </u></td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	<u>  N  </u>	2	<u>  N  </u>	3	<u>  N  </u>	4	<u>  N  </u>	5	<u>  Y  </u>	6	<u>  N  </u>	7	<u>  N  </u>
1	<u>  N  </u>														
2	<u>  N  </u>														
3	<u>  N  </u>														
4	<u>  N  </u>														
5	<u>  Y  </u>														
6	<u>  N  </u>														
7	<u>  N  </u>														
<b>B. Sediment Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>  N  </u></td></tr> <tr><td>2</td><td><u>  N  </u></td></tr> <tr><td>3</td><td><u>  Y  </u></td></tr> <tr><td>4</td><td><u>  N  </u></td></tr> <tr><td>5</td><td><u>  Y  </u></td></tr> <tr><td>6</td><td><u>  N  </u></td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	<u>  N  </u>	2	<u>  N  </u>	3	<u>  Y  </u>	4	<u>  N  </u>	5	<u>  Y  </u>	6	<u>  N  </u>		
1	<u>  N  </u>														
2	<u>  N  </u>														
3	<u>  Y  </u>														
4	<u>  N  </u>														
5	<u>  Y  </u>														
6	<u>  N  </u>														
<b>C. Nutrient and Toxicant Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>  N  </u></td></tr> <tr><td>2</td><td><u>  Y  </u></td></tr> <tr><td>3</td><td><u>  Y  </u></td></tr> <tr><td>4</td><td><u>  Y  </u></td></tr> <tr><td>5</td><td><u>  Y  </u></td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	<u>  N  </u>	2	<u>  Y  </u>	3	<u>  Y  </u>	4	<u>  Y  </u>	5	<u>  Y  </u>				
1	<u>  N  </u>														
2	<u>  Y  </u>														
3	<u>  Y  </u>														
4	<u>  Y  </u>														
5	<u>  Y  </u>														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-18-13Wetland ID: DP12

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <ol style="list-style-type: none"> <li>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</li> <li>2 A herbaceous layer is part of this dense vegetation.</li> <li>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and its Export</b> <ol style="list-style-type: none"> <li>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</li> <li>2 Woody plants in wetland are mostly deciduous.</li> <li>3 High degree of plant community structure, vegetation density, and species richness present.</li> <li>4 Interspersion of vegetation and water is high in wetland.</li> <li>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6** <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b> <ol style="list-style-type: none"> <li>1 Wetland is not fragmented by development.</li> <li>2 Upland surround wetland is undeveloped.</li> <li>3 Wetland has connectivity with other habitat types.</li> <li>4 Diversity of plant species is high.</li> <li>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</li> <li>6 Has high degree of Cowardin Class interspersion</li> <li>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>N</u>  5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <ol style="list-style-type: none"> <li>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</li> <li>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</li> <li>3 Observation of fish.</li> <li>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</li> <li>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</li> <li>6 Juvenile rearing areas.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b> <ol style="list-style-type: none"> <li>1 Dominant and codominant plants are native.</li> <li>2 Wetland contains two or more Cowardin Classes.</li> <li>3 Wetland has three or more strata of vegetation.</li> <li>4 Wetland has mature trees.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u>  3-4 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

No direct  
habitat  
in  
wetland  
(LS)

Date: 7-18-13Wetland ID: DP2

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b> 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - (Low) or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP14

Date: 7-19-13

Wetland Type: P E M I I S S I E

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td style="text-align: right;">1</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: right;">2</td><td style="text-align: center;">Y</td></tr> <tr><td style="text-align: right;">3</td><td style="text-align: center;">N</td></tr> <tr><td style="text-align: right;">4</td><td style="text-align: center;">Y</td></tr> <tr><td style="text-align: right;">5</td><td style="text-align: center;">Y</td></tr> <tr><td style="text-align: right;">6</td><td style="text-align: center;">N Y</td></tr> <tr><td style="text-align: right;">7</td><td style="text-align: center;">N</td></tr> </tbody> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	N	4	Y	5	Y	6	N Y	7	N
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NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-19-13Wetland ID: DP14

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <ol style="list-style-type: none"> <li>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</li> <li>2 A herbaceous layer is part of this dense vegetation.</li> <li>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <div style="text-align: right;"><i>NA</i></div> <ol style="list-style-type: none"> <li>1 <u>Y</u></li> <li>2 <u>Y</u></li> <li>3 <u>Y</u></li> </ol> 2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and Its Export</b> <ol style="list-style-type: none"> <li>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</li> <li>2 Woody plants in wetland are mostly deciduous.</li> <li>3 High degree of plant community structure, vegetation density, and species richness present.</li> <li>4 Interspersion of vegetation and water is high in wetland.</li> <li>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <ol style="list-style-type: none"> <li>1 <u>Y</u></li> <li>2 <u>Y</u></li> <li>3 <u>Y</u></li> <li>4 <u>Y</u></li> <li>5 <u>Y</u></li> <li>6** <u>Y</u></li> </ol> 4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b> <ol style="list-style-type: none"> <li>1 Wetland is not fragmented by development.</li> <li>2 Upland surround wetland is undeveloped.</li> <li>3 Wetland has connectivity with other habitat types.</li> <li>4 Diversity of plant species is high.</li> <li>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</li> <li>6 Has high degree of Cowardin Class interspersion</li> <li>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <ol style="list-style-type: none"> <li>1 <u>Y</u></li> <li>2 <u>Y</u></li> <li>3 <u>Y</u></li> <li>4 <u>Y</u> ✓</li> <li>5 <u>Y</u></li> <li>6 <u>Y</u></li> <li>7 <u>Y</u></li> </ol> 5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <ol style="list-style-type: none"> <li>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</li> <li>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</li> <li>3 Observation of fish.</li> <li>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</li> <li>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</li> <li>6 Juvenile rearing areas.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <div style="text-align: right;"><i>NA</i></div> <ol style="list-style-type: none"> <li>1 _____</li> <li>2 _____</li> <li>3 _____</li> <li>4 _____</li> <li>5 _____</li> <li>6 _____</li> </ol> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b> <ol style="list-style-type: none"> <li>1 Dominant and codominant plants are native.</li> <li>2 Wetland contains two or more Cowardin Classes.</li> <li>3 Wetland has three or more strata of vegetation.</li> <li>4 Wetland has mature trees.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <ol style="list-style-type: none"> <li>1 <u>Y</u></li> <li>2 <u>Y</u></li> <li>3 <u>N</u></li> <li>4 <u>N</u></li> </ol> 3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-19-13Wetland ID: DP14

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP17

Date: 7-20-13

Wetland Type: PSS3/PEM1B  
~~Pem1/SS14BJS~~

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>N</u> 6 <u>N</u> 7 <u>N</u> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u> 4 <u>N</u> 5 <u>N</u> 6 <u>N</u> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-20-13Wetland ID: DP17

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N) <u>NA</u></p> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>2-3 (Y) - High Function</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
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Date: 7-20-13Wetland ID: DP17

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
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## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP19

Date: 7-20-13

Wetland Type:

PSS413/PEM1B  
~~PSS413/SS41B~~

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>N</td></tr> <tr><td>7</td><td>N</td></tr> </tbody> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	N	4	Y	5	N	6	N	7	N
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NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-20-13Wetland ID: DP19

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>2-3 (Y) - High Function</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u> ✓</p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-20-13Wetland ID: DP19

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b>  1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - (Low) or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DPW

Date: 7-20-13

Wetland Type: PSS3/PPM1B

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>N</td></tr> <tr><td>7</td><td>N</td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	Y	4	N	5	N	6	N	7	N
1	N														
2	Y														
3	Y														
4	N														
5	N														
6	N														
7	N														
<b>B. Sediment Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>N</td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	N	3	Y	4	N	5	N	6	N		
1	N														
2	N														
3	Y														
4	N														
5	N														
6	N														
<b>C. Nutrient and Toxicant Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	N	3	Y	4	Y	5	Y				
1	N														
2	N														
3	Y														
4	Y														
5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-28-13Wetland ID: DP20

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide (Y or N)</b> <i>NA</i> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>2-3 (Y) - High Function</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersed</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u> ✓</p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide (Y or N)</b> <i>NA</i> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-20-13Wetland ID: DP20

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <u>Low</u> or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP22

Date: 7-20-13

Wetland Type: PEM11 PSS1E

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> <u>Y</u> 4 <u>N</u> <u>Y</u> 5 <u>Y</u> 6 <u>N</u> 7 <u>N</u>  5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>N</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>N</u>  4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> <b>(Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-20-13Wetland ID: DP 22

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>2-3 (Y) - High Function</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>N</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide</b> <b>(Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>3-4 (Y) - High Function ✓</p> <p>1-2 (Y) - Moderate Function</p> <p>None - Low or No Function</p>

Date: 7-20-18Wetland ID: DP22

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>Y</u> <u>N</u> VATH, TOWA (USFS) 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - <u>Low</u> or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP23

Date: 7-21-13

Wetland Type: PEM/SSIC (topo lows) Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td><del>N</del> Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td><del>N</del> N</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td>N</td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	<del>N</del> Y	3	N	4	<del>N</del> N	5	Y	6	Y	7	N
1	N														
2	<del>N</del> Y														
3	N														
4	<del>N</del> N														
5	Y														
6	Y														
7	N														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. (from Grant Cr.)</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td><del>N</del> N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>N</td></tr> </table> 4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function	1	<del>N</del> N	2	Y	3	Y	4	Y	5	Y	6	N		
1	<del>N</del> N														
2	Y														
3	Y														
4	Y														
5	Y														
6	N														
<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td><del>N</del> Y</td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	Y	4	Y	5	<del>N</del> Y				
1	N														
2	Y														
3	Y														
4	Y														
5	<del>N</del> Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-21-13Wetland ID: DP 23

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>N</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<b>Likely or not likely to Provide (Y or N)</b> <del>NA</del> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>H. Native Plant Richness</b> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<b>Likely or not likely to Provide (Y or N)</b> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>3-4 (Y) - High Function ✓</p> <p>1-2 (Y) - Moderate Function</p> <p>None - Low or No Function</p>

Date: 7-21-13Wetland ID: DP23

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - <u>Low</u> or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP 24

Date: 7-22-13

Wetland Type:

PSS / PLEMIC  
RETT / SSTC (topo lows)

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>Y</u> <u>N</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>N</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-22-13Wetland ID: DP24

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p><b>Likely or not likely to Provide (Y or N)</b></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p><b>Likely or not likely to Provide (Y or N)</b></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p><b>Likely or not likely to Provide (Y or N)</b></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p><b>Likely or not likely to Provide (Y or N)</b> <del>NA</del></p> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p><b>Likely or not likely to Provide (Y or N)</b></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>Y</u></p> <p>3-4 (Y) - High Function ✓</p> <p>1-2 (Y) - Moderate Function</p> <p>None - Low or No Function</p>

Date: DP 24Wetland ID: 7-22-13

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - (Low or No Function)
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function ✓ None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP25

Date: 7-22-13

Wetland Type: PEMA/SSIC PEMAIC

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>Y</u> <u>N</u> 5 <u>N</u> 6 <u>Y</u> 7 <u>N</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-22-13Wetland ID: DP25

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p><b>Likely or not likely to Provide</b> (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p><b>Likely or not likely to Provide</b> (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p><b>Likely or not likely to Provide</b> (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p><b>Likely or not likely to Provide</b> (Y or N) <del>NAF</del></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p><b>Likely or not likely to Provide</b> (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-22-13Wetland ID: DP 25

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP27

Date: 7-23-13

Wetland Type: PEMIE

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>N</u> 6 <u>Y</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-23-13Wetland ID: DP 27

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and Its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6 <u>N</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p> <p><i>Elevated to "high" w/ waterbird habitat (limited)</i></p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N) <b>NA</b></p> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-23-13Wetland ID: DP 27

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b> 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None (Low) or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID:

DP 29

Date:

7-24-13

Wetland Type:

PSS1/PEM1E  
PEM1SS1E

Investigators:

C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td>Y</td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	N	4	N	5	N	6	Y	7	Y
1	N														
2	Y														
3	N														
4	N														
5	N														
6	Y														
7	Y														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>Y</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>N</td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	Y	2	Y	3	Y	4	N	5	Y	6	N		
1	Y														
2	Y														
3	Y														
4	N														
5	Y														
6	N														
<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	Y	4	Y	5	Y				
1	N														
2	Y														
3	Y														
4	Y														
5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-24-13Wetland ID: DP 29

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N) <u>NA</u></p> <p>1 <u>X</u></p> <p>2 <u>X</u></p> <p>3 <u>X</u></p> <p>4 <u>X</u></p> <p>5 <u>X</u></p> <p>6 <u>X</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-24-13Wetland ID: DP29

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>N</u> 3 <u>Y</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP 31

Date: 7-24-13

Wetland Type: PSS/EMIE

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-24-13Wetland ID: DP31

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(If associated with a watercourse or shoreline)</i> <ol style="list-style-type: none"> <li>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</li> <li>2 A herbaceous layer is part of this dense vegetation.</li> <li>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function
<b>E. Production of Organic Matter and its Export</b> <ol style="list-style-type: none"> <li>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</li> <li>2 Woody plants in wetland are mostly deciduous.</li> <li>3 High degree of plant community structure, vegetation density, and species richness present.</li> <li>4 Interspersion of vegetation and water is high in wetland.</li> <li>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>6 Wetland has outlet from which organic matter is flushed.**  **If #6 is No, then wetland automatically rated as low or No function</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6** <u>Y</u> 4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>F. General Wildlife Habitat Suitability</b> <ol style="list-style-type: none"> <li>1 Wetland is not fragmented by development.</li> <li>2 Upland surround wetland is undeveloped.</li> <li>3 Wetland has connectivity with other habitat types.</li> <li>4 Diversity of plant species is high.</li> <li>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</li> <li>6 Has high degree of Cowardin Class interspersion</li> <li>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u> 7 <u>Y</u> 5-7 (Y) - High Function ✓ 1-4 (Y) - Moderate Function None - Low or No Function
<b>G. General Fish Habitat</b> <i>(Must be associated with a fish-bearing stream or lake)</i> <ol style="list-style-type: none"> <li>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</li> <li>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</li> <li>3 Observation of fish.</li> <li>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</li> <li>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</li> <li>6 Juvenile rearing areas.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> <u>NA</u> 1 <u>N</u> 2 <u>N</u> 3 <u>N</u> 4 <u>N</u> 5 <u>N</u> 6 <u>N</u> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function None - Low or No Function
<b>H. Native Plant Richness</b> <ol style="list-style-type: none"> <li>1 Dominant and codominant plants are native.</li> <li>2 Wetland contains two or more Cowardin Classes.</li> <li>3 Wetland has three or more strata of vegetation.</li> <li>4 Wetland has mature trees.</li> </ol>	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>Y</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 3-4 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function

Date: 7-24-13Wetland ID: DP37

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 2-3 (Y) - High Function <input checked="" type="checkbox"/> 1 (Y) - Moderate Function <input checked="" type="checkbox"/> None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u> 3-4 (Y) - High Function 1-2 (Y) - Moderate Function None (Low or No Function)
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 2-3 (Y) - High Function <input checked="" type="checkbox"/> 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP33

Date: ~~DP33~~ 7-24-13

Wetland Type: PEM1H

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>N</td></tr> <tr><td>5</td><td>N</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td><del>N</del> Y</td></tr> </tbody> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	N	4	N	5	N	6	Y	7	<del>N</del> Y
1	N														
2	Y														
3	N														
4	N														
5	N														
6	Y														
7	<del>N</del> Y														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> </tbody> </table> 4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	Y	4	Y	5	Y	6	Y		
1	N														
2	Y														
3	Y														
4	Y														
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<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </tbody> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	Y	4	Y	5	Y				
1	N														
2	Y														
3	Y														
4	Y														
5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-25-13Wetland ID: D33

<p><b>D. Erosion Control and Shoreline Stabilization</b> (If associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and Its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersions</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p> <p>↳ (dead duckling found here)</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6 <u>N</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function</p> <p>1-4 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N) <b>NA</b></p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>Y</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-25-13Wetland ID: DP33

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide</b> (Y or N) 1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide</b> (Y or N) 1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function



## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP35

Date: 7-25-13

Wetland Type: ~~PEM1E/SSIE~~  
PEM1/SSIE

Investigators: CSchudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization)  1 Wetland occurs in the upper portion of its watershed. 2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events. 3 Wetland is a closed (depressional) system. 4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris. 5 Wetland has dense woody vegetation. 6 Wetland receives floodwater from an adjacent water course. 7 Floodwater come as sheet flow rather than channel flow.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u> 4 <u>N</u> 5 <u>N</u> 6 <u>Y</u> 7 <u>Y</u>  5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function
<b>B. Sediment Removal</b>  1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland. 2 Slow-moving water and/or a deepwater habitat are present in the wetland. 3 Dense herbaceous vegetation is present. 4 Inerspersion of vegetation and water is high in wetland. 5 Ponding of water is high in wetland. 6 Sediment deposits are present in wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u> 6 <u>Y</u>  4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function
<b>C. Nutrient and Toxicant Removal</b>  1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland. 2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season. 3 Wetland provides long duration for water detention. 4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation. 5 Fine grained mineral or organic materials are present for the wetland.	<b>Likely or not likely to Provide</b> (Y or N)  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u> 4 <u>Y</u> 5 <u>Y</u>  3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-25-13Wetland ID: DP35

<p><b>D. Erosion Control and Shoreline Stabilization</b> (if associated with a watercourse or shoreline)</p> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>2-3 (Y) - High Function ✓</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>E. Production of Organic Matter and its Export</b></p> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function ✓</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>F. General Wildlife Habitat Suitability</b></p> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>Y</u></p> <p>4 <u>Y</u></p> <p>5 <u>Y</u></p> <p>6 <u>N</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>G. General Fish Habitat</b> (Must be associated with a fish-bearing stream or lake)</p> <p>1 Wetland has perennial or intermittent surface-water connection to a fish-bearing water body.</p> <p>2 Wetland has sufficient size and depth of open water so as not to freeze completely during winter.</p> <p>3 Observation of fish.</p> <p>4 Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.</p> <p>5 Spawning areas are present (aquatic vegetation and/or gravel beds).</p> <p>6 Juvenile rearing areas.</p>	<p>Likely or not likely to Provide (Y or N) <u>NA</u></p> <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>Y</u></p> <p>5 <u>N</u></p> <p>6 <u>N</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<p><b>H. Native Plant Richness</b></p> <p>1 Dominant and codominant plants are native.</p> <p>2 Wetland contains two or more Cowardin Classes.</p> <p>3 Wetland has three or more strata of vegetation.</p> <p>4 Wetland has mature trees.</p>	<p>Likely or not likely to Provide (Y or N)</p> <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>3-4 (Y) - High Function</p> <p>1-2 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>

Date: 7-25-13Wetland ID: DP35

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
<b>J. Uniqueness and Heritage</b>  1 Wetland contains documented occurrences of a state or federally listed threatened or endangered species.** 2 Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS.** 3 Wetland has biological, geological, or other features that are determined to be rare. 4 Wetland type is a highly valuable wetland type of the State.** **If #1, #2, or #4 is Yes, then wetland is automatically rated as high	<b>Likely or not likely to Provide (Y or N)</b>  1** <u>N</u> 2** <u>N</u> 3 <u>N</u> 4** <u>N</u>  3-4 (Y) - High Function 1-2 (Y) - Moderate Function None - Low or No Function
<b>K. Groundwater Interchange</b>  1 Presence of seeps or springs 2 Microrelief of wetland surface 3 Surficial geologic deposits under wetland are permeable (e.g. alluvium)	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>Y</u>  2-3 (Y) - High Function ✓ 1 (Y) - Moderate Function None - Low or No Function





## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP37

Date: 7-25-13

Wetland Type: PFO4B/PEMIB

Investigators: C. Schwedel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ul style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>Y</u></td></tr> <tr><td>2</td><td><u>N</u></td></tr> <tr><td>3</td><td><u>N</u></td></tr> <tr><td>4</td><td><u>N</u></td></tr> <tr><td>5</td><td><u>Y</u></td></tr> <tr><td>6</td><td><u>N</u></td></tr> <tr><td>7</td><td><u>N</u></td></tr> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	<u>Y</u>	2	<u>N</u>	3	<u>N</u>	4	<u>N</u>	5	<u>Y</u>	6	<u>N</u>	7	<u>N</u>
1	<u>Y</u>														
2	<u>N</u>														
3	<u>N</u>														
4	<u>N</u>														
5	<u>Y</u>														
6	<u>N</u>														
7	<u>N</u>														
<b>B. Sediment Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>N</u></td></tr> <tr><td>2</td><td><u>N</u></td></tr> <tr><td>3</td><td><u>Y</u></td></tr> <tr><td>4</td><td><u>N</u></td></tr> <tr><td>5</td><td><u>N</u></td></tr> <tr><td>6</td><td><u>N</u></td></tr> </table> 4-6 (Y) - High Function 1-3 (Y) - Moderate Function ✓ None - Low or No Function	1	<u>N</u>	2	<u>N</u>	3	<u>Y</u>	4	<u>N</u>	5	<u>N</u>	6	<u>N</u>		
1	<u>N</u>														
2	<u>N</u>														
3	<u>Y</u>														
4	<u>N</u>														
5	<u>N</u>														
6	<u>N</u>														
<b>C. Nutrient and Toxicant Removal</b> <ul style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ul>	<b>Likely or not likely to Provide</b> (Y or N) <table border="0"> <tr><td>1</td><td><u>N</u></td></tr> <tr><td>2</td><td><u>N</u></td></tr> <tr><td>3</td><td><u>N</u></td></tr> <tr><td>4</td><td><u>Y</u></td></tr> <tr><td>5</td><td><u>Y</u></td></tr> </table> 3-5 (Y) - High Function 1-2 (Y) - Moderate Function ✓ None - Low or No Function	1	<u>N</u>	2	<u>N</u>	3	<u>N</u>	4	<u>Y</u>	5	<u>Y</u>				
1	<u>N</u>														
2	<u>N</u>														
3	<u>N</u>														
4	<u>Y</u>														
5	<u>Y</u>														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-25-13Wetland ID: DP 37

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i> <p>1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.</p> <p>2 A herbaceous layer is part of this dense vegetation.</p> <p>3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.</p>	<b>Likely or not likely to Provide</b> (Y or N) <u>NA</u> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>2-3 (Y) - High Function</p> <p>1 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
<b>E. Production of Organic Matter and its Export</b> <p>1 Wetland has at least 30% aerial cover of dense herbaceous vegetation.</p> <p>2 Woody plants in wetland are mostly deciduous.</p> <p>3 High degree of plant community structure, vegetation density, and species richness present.</p> <p>4 Interspersion of vegetation and water is high in wetland.</p> <p>5 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</p> <p>6 Wetland has outlet from which organic matter is flushed.**</p> <p>**If #6 is No, then wetland automatically rated as low or No function</p>	<b>Likely or not likely to Provide</b> (Y or N) <p>1 <u>Y</u></p> <p>2 <u>N</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6** <u>Y</u></p> <p>4-6 (Y) - High Function</p> <p>1-3 (Y) - Moderate Function ✓</p> <p>None - Low or No Function</p>
<b>F. General Wildlife Habitat Suitability</b> <p>1 Wetland is not fragmented by development.</p> <p>2 Upland surround wetland is undeveloped.</p> <p>3 Wetland has connectivity with other habitat types.</p> <p>4 Diversity of plant species is high.</p> <p>5 Wetland has more than one Cowardin Class (e.g. PFO, PSS, PEM...)</p> <p>6 Has high degree of Cowardin Class interspersion</p> <p>7 Evidence of wildlife use (e.g. tracks, scat, gnawed stumps) present.</p>	<b>Likely or not likely to Provide</b> (Y or N) <p>1 <u>Y</u></p> <p>2 <u>Y</u></p> <p>3 <u>N</u></p> <p>4 <u>N</u></p> <p>5 <u>N</u></p> <p>6 <u>N</u></p> <p>7 <u>Y</u></p> <p>5-7 (Y) - High Function ✓</p> <p>1-4 (Y) - Moderate Function</p> <p>None - Low or No Function</p>
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Date: 7-25-13Wetland ID: DP37

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function ✓ None - Low or No Function
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## Kenia Hydro, LLC - Grant Lake Project

## WETLAND FUNCTIONS DATA FORM

Alaska Regulatory Best Professional Judgement Characterization

Adapted from Regulatory Guidance Letter 09-01

Wetland ID: DP 39

Date: 7-25-13

Wetland Type: PSS1/EM1B

Investigators: C. Schudel J. Blank

<b>A. Flood Flow Alteration</b> (Storage and Desynchronization) <ol style="list-style-type: none"> <li>1 Wetland occurs in the upper portion of its watershed.</li> <li>2 Wetland is relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall events.</li> <li>3 Wetland is a closed (depressional) system.</li> <li>4 If flowthrough, wetland has constructed outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.</li> <li>5 Wetland has dense woody vegetation.</li> <li>6 Wetland receives floodwater from an adjacent water course.</li> <li>7 Floodwater come as sheet flow rather than channel flow.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>N</td></tr> <tr><td>4</td><td>Y N</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> <tr><td>7</td><td>N</td></tr> </tbody> </table> 5-7 (Y) - High Function 1-4 (Y) - Moderate Function ✓ None - Low or No Function	1	N	2	Y	3	N	4	Y N	5	Y	6	Y	7	N
1	N														
2	Y														
3	N														
4	Y N														
5	Y														
6	Y														
7	N														
<b>B. Sediment Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess sediment (from tillage, mining or construction) are present upgradient of the wetland.</li> <li>2 Slow-moving water and/or a deepwater habitat are present in the wetland.</li> <li>3 Dense herbaceous vegetation is present.</li> <li>4 Inerspersion of vegetation and water is high in wetland.</li> <li>5 Ponding of water is high in wetland.</li> <li>6 Sediment deposits are present in wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>N</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> <tr><td>6</td><td>Y</td></tr> </tbody> </table> 4-6 (Y) - High Function ✓ 1-3 (Y) - Moderate Function None - Low or No Function	1	N	2	N	3	Y	4	Y	5	Y	6	Y		
1	N														
2	N														
3	Y														
4	Y														
5	Y														
6	Y														
<b>C. Nutrient and Toxicant Removal</b> <ol style="list-style-type: none"> <li>1 Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.</li> <li>2 Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.</li> <li>3 Wetland provides long duration for water detention.</li> <li>4 Wetland has at least 30% aerial cover of live dense herbaceous vegetation.</li> <li>5 Fine grained mineral or organic materials are present for the wetland.</li> </ol>	<b>Likely or not likely to Provide</b> (Y or N) <table> <tbody> <tr><td>1</td><td>N</td></tr> <tr><td>2</td><td>Y</td></tr> <tr><td>3</td><td>Y</td></tr> <tr><td>4</td><td>Y</td></tr> <tr><td>5</td><td>Y</td></tr> </tbody> </table> 3-5 (Y) - High Function ✓ 1-2 (Y) - Moderate Function None - Low or No Function	1	N	2	Y	3	Y	4	Y	5	Y				
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2	Y														
3	Y														
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5	Y														

NOTE: Base wetland function assessment on existing conditions, not future conditions.

Example Ranking: If ranking the capacity for a wetland to perform a given wetland function into high, moderate, low or none categories, use the following example as guidance. For Flood Flow Alteration, answering yes to five to seven attributes would rate the wetland as high functioning; answering yes to one to four attributes would rate the wetland as moderate; and not answering yes to any attributes would rate the wetland as low, or if evaluator is certain the wetland does not perform this function, it can be rated as none.

Date: 7-25-13Wetland ID: DP 39

<b>D. Erosion Control and Shoreline Stabilization</b> <i>(if associated with a watercourse or shoreline)</i>  1 Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion. 2 A herbaceous layer is part of this dense vegetation. 3 Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.	<b>Likely or not likely to Provide (Y or N)</b>  1 <u>Y</u> 2 <u>Y</u> 3 <u>Y</u> 2-3 (Y) - High Function <input checked="" type="checkbox"/> 1 (Y) - Moderate Function None - Low or No Function
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Date: 7-25-13Wetland ID: DP89

<b>I. Educational or Scientific Value</b>  1 Site has documented scientific or educational use. 2 Wetland is in public ownership 3 Accessible trails available.	<b>Likely or not likely to Provide (Y or N)</b> 1 <u>N</u> 2 <u>Y</u> 3 <u>N</u>  2-3 (Y) - High Function 1 (Y) - Moderate Function None - Low or No Function
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6178583

GRANT LAKE

KENAI HYDRO

FIELD BOOK #1 OF 2



"Rite in the Rain®"

ALL-WEATHER

FIELD

No. 353N

## CONTENTS

PAGE	REFERENCE	DATE
POST-FIELD UPDATES TO FIELD NOTES		
<p>- Reference to the presence of <i>Agrostis gigantea</i>, <i>Agrostis stolonifera</i>, or "red top" has been updated to <i>Calamagrostis canadensis</i> in datasheets based on post-field GATAC. Apply this update throughout Field notes</p> <p>- NW1 codes have been updated throughout field notes &amp; datasheets based on post-field GATAC</p> <p>- Photo numbers have been updated where needed in field notes</p>		

7-16-13 Crescent Lake - Wetlands

pg 1/5 3

0178583

0800 packed gear

0900 met @ scenic Mtn Air

10:15 left SMA in plane

11:00 Begin site recon

12:30 DPO' PPM 1/551C

Representative sample pt. of herbaceous shrub community on lake shore. Area clearing floods in spring, lots of feeder channels + evidence of prev. inundation. Area likely under water when geomorph even came out

photos: 619 - 623

GPS pts:

1 = DPO

2 - 15 = bndry pts.

Numerous temporary / seasonal but flow channels, active. Some areas inundated.

pg 2/5

7-16-13 Grant Lake Wetlands

1330 DPO2 PSS1E

Representative of Alder/Willow shrub community. This pt. is located betw 2 outflow channels w/ portions of unchanneled sheet flow.

Gravel/sandy soils

This community is generally formed a band betw the PSS/PBM-Shrubline & the PFD for

GPS: DPO2 = pt 16

Boundary = 17-18

(area cut off by H<sub>2</sub>O + steep cliff w/ trees, H<sub>2</sub>O + cliff band to creek boundary).

photos 627-630

\* 624-626 screening snots

GPS: DPO1 'Stream'

Photos 631-633

gravel bottom one of the main outflow channels.

braided outwash  
150 ft across at widest

med-fast flow

4

pg 3/5

7-16-13 Grant Lake Wetlands

GPS DPO2 pt 20 side channel

6 ft across, herbaceous veg loops across on banks, beaver dammed, see field map

abandoned side channel steep bank slow to no flow ~3 ft deep

photos 634-635 silty gravel bottom

1510 DPO3 PBM/SS1E

Rep. pt. of the herb/scrub/shrub wetland adj. to lake. small outflow channels (GPS'd as observed 10m pts) 10-30 ft community intermittently

GPS pt #21 DPO3

photos 636-641

Boundary pts betw Lake Shore &amp; DPO3

DPO3/DPO4 community =

GPS pts 22-34 ish

Boundary pts betw DPO3/DPO4 communities 35 ish - 58

OBB = GPS pt 35 stagnant outflow channel ~3 ft wide, veg banks silty gravel bottom ~1 ft deep

6

Pg 4/5

7-16-13 Grant Lake Wetlands

1400 DPO4 ~~PSS+B~~ GPS pt #50

Rep. pt. of the PSS+B willow/alders community → PSS1 PEM1B 50

photos: 642-646

1440 DPO5 UPL GPS pt #59

Representative upland pt.

Upland/Wetland boundary determined using cottonwoods + tree stratum *salix alexensis* as the indicator.

Photos: 647-650.

Boundary btwn DPO4 (PSS) + DPO5 (Upl.)  
GPS pts. 60-74 64

Notes: upl/pss boundary: 60-64

Shore/PEM Boundary: 65-66

Shore/pss 67-74

Arranged to have Vera pick us up @ 6:00 pm. Got a pick-up at 6:45 pm. Recognized the other 1/2 of the lake area.

Pg 5/5

7-16-13 Grant Lake Wetlands

Note: Arranged to be picked up at 6am w/ Vera, didn't leave until ~10am

8pm

Drove back to apt in Moose Park + doing data QA/QC

7:45pm end of Day

Jeanette - Ask Marc Johnson if the lake has fish; if so then we need to fish Functional Assessment Sheets

Ask Arnel about wildlife for unique function in EA form.



8

7-17-13 Grant Lake Wetlands 1/11  
 0730 Field prep, load gear, call w/ JG,  
 0900 to confirm 5 ft <sup>off</sup> ~~off~~ vertical  
 0920 OP elev. is sufficient map  
 area. Will proceed that it is.

0800 Met at SMA, took <sup>loaded plants</sup> off on time.

0900 Arrived at lake

Note: Since resolution of aeriels are  
 so poor, it is v. difficult to map  
 boundaries accurately in the  
 field - will be v. diff. to transfer +  
 QAOE in GIS. Instead we will focus  
 on getting as many data observations  
 pts. as possible today & then use  
 the photos we took from the plane  
 to map the boundaries in GIS.

\* New GPS File Grant Lake 071713<sup>Grant</sup>

0930 ~~OP~~4- PEMA/SSLE <sup>maps, for map quality</sup>

GPS #1 <sup>fixed point yesterday so start</sup>

Photos: 661 & 662 <sup>to be taken right now</sup>

Obs. pt. taken to doc. that this comm.  
 is the same as similar to DPO3

2/11 9

7-17-13 Grant Lake

663-664

photos of 2 stickleback fish found  
 at shore next DPO5.

0940 ~~OP05~~ - PSS1B

GPS 2

Photos ~~670~~ [667-69 footprints] <sup>beaver</sup>

Obs pt. rep. of DPO4 PSS1B

OP06

1000 ~~OP07~~ - Upland

GPS 3

photo. 671-672

Obs pt. rep. of DPO5 upland  
 alder/cottonwood

Badly pts GPS 4-11 = Buses the  
 PEMA/SSLE boundary (see fieldmap 22)

1005 ~~OP08~~ <sup>GPS #12</sup> - abandoned or cut off  
 outflow channel.

24 ft wide, up to 2 ft deep,

gravel/sand bottom H<sub>2</sub>O is clear  
 + stagnant. Veg banks of PSS1B

beaver. No flow

pt. taken in center of channel see  
 photo 673

10

3/11

7-17-B Grant Lake

10:15 OP08

photo 674

GPS 13

Side channel w/ beaver dam  
~4 ft wide ~2 ft deep. No flow  
less clear, stagnant some algae  
gravel sand & sticks on bottom  
Veg banks = PSS1B comm.

10:30 OP09

photo 675

GPS 14

Same description as OP08

10:45 OP10 - PSS1B

photo 676-77

GPS 15

pt. Rep. of PSS1B common similar  
to DP04.

11:15 DP06 - PSS1C/PSS1C<sup>2</sup>

pt. rep. of SLS comm. adj. to lake  
shore in old outwash fan.

There is a broad transition zone  
to the upland area that is noted

4/11

7-17-13 Grant Lake

in DP07. For the boundary b/w  
DP06/DP07 will need to take  
photos we took from plane & take  
the lake-side margin of the tall  
trees as the boundary. This will  
be a conservative boundary, &  
most likely include <sup>some</sup> more uplands  
in wetland b/w but transition is  
gradual & diff. to delineate. This  
bed fan appears to be converting to  
an upland (i.e. cottonwood & white  
spruce (fack)) are colonizing towards  
shoreline.

GPS #16

photos 678-681

use 682-84 to help w/ mapping.

GPS #17 = approx b/w b/w big  
trees on aerial <sup>line</sup>

10:35 DP07 - upl

pt. rep. of upl. community in old  
outwash fan. New recent succession  
of cottonwoods & tree ~~fall~~ <sup>fall</sup> ~~salix~~ <sup>salix</sup> ~~alex~~

7-17-13

Soils v. dry large gravel, sand & silt.  
Evidence of early season flooding  
but area likely ~~at~~ well drained  
& does not retain enough H<sub>2</sub>O to  
establish hydric conditions  
GPS#18  
photos. 68E-88

1200 OP11

old channel, abandoned moat  
but no standing H<sub>2</sub>O  
photos: 689-690  
GPS-19

12:30 0P12 - PSS1C

documenting continued alder/willow  
S/S wetland comm. this is a  
drier transitional area. Not currently  
sat. but clearly floods at times.  
photo 697-98  
GPS 20

1245. OP 13 - upland transition

pt taken at approx boundary between  
PSSIC @ OPZ & uplands immediately

6/11  
13

Grant Lake. 7-17-13

inland from this spot (go by tall trees in aerial). Veg is <sup>alder</sup> ~~alder~~, sal sitch, alex, <sup>sal</sup> ~~agrostis~~ + raspberry & fireweed.

GPS 21

photo 699-708

1247 OF 14 - River

photos 101-204 E, W, N, S

GPS 22

pt. taken in middle of outwash fan. Active channel meanders from ~~the~~ side of fan to ① where is enters lake. Fan is gravels & sand little to no veg in active fan. Active channel 4-5 ft wide. 1-2 ft deep clear, flowing. Veg banks are the alder/willow PSSIC community.

1300 DP08- ~~PAT~~ PSSi/PtMIB

pt rep of s/s the b community  
on (N) side of <sup>Bay area</sup> Vazirant weath farm  
a/dor / will + ~~top~~ / equisetaura

QPS 23 photos 705-710



14

7/11

7-17-13 Grant Lake  
13<sup>th</sup> DP09 - PSS1B

GPS 24, Photos 711-714  
Typical PSS1B alder/willow comm.

13<sup>th</sup> DP10 - PEM1F

GPS 25

photo 715-718

pt rep. of a inundated grass comm.  
located in an alcove on the  $\textcircled{N}$  end  
of shore where it appears to be converted  
back to ~~the~~ land just opposed to open  
lake H<sub>2</sub>O.

Can't make out a bndry on map  
bnt on aerial photo taken from  
plane this PEM1F is w. in  
the water  $\textcircled{N}$  of N most active outwash  
fan, it's the darker circular  
area in the H<sub>2</sub>O. DP08 is the  
light grn area btrn this & the  
fan, & DP09 is the S/S comm.  
flanked by DP08 & DP10

1420 OP15 - PSS1E

Same willow/alder community  
we've been seeing but this area  
is seasonal/semi permanent

15

8/11

7-17-13 - Grant Lake

Inundated w/ water. There are  
pockets of cottonwoods that are on  
small high mounds - too small to  
map - but note that tree crowns  
evident in averts in this area are  
small upland islands

GPS = 26

photos = 720-22

1430 GP16

GPS 27

Photo 723-725, 726

Small inlet of lake, latest active  
beaver dam @ outflow channel  
this is causing inundation  
in S/S communities <sup>W</sup> surrounding  
as seen in OP17

X Observed a sculping ~2" long  
ate OP16

OP17 -

Taken @ NE corner of beaver

photos 727-732

GPS ~~28~~ 34



9/11

7-17-13 Grant Lake

GPS 28-33 bndry pts blown up!  
on NE side of bndry + wetland on SW  
Wetland is a continuation of  
the PSS1E we saw at DP15

DP1545 DP11 upland

pt. located in upland comm. that closes  
out the lake 'inlet' area. This is at  
the base of an avalanche/debris  
fan. Forms the boundary w/ PSS1E  
community @ DP15, elevation change  
& substrate change account for quick  
transition

GPS 35

photos 748-753

Boundary pt notes

GPS 36-42ish

lake shore / upl. bndry @ DP11  
transition to lakeshore/PSS bndry  
GPS 43ish-51 = lakeshore/PSS boundary  
52-56 = PSS/EM / lakeshore boundary  
that wraps around to for RB of  
outwash

10/11

7-17-13 Grant Lake

GPS 56-61 continued bndry along  
RB of outwash fan @ 56, comm. goes  
from the PSS/EM (see D.P.) to PSS  
comm. bndry on RB ends @ 7  
in river.

GPS bndry 62-67 bndry of LB of  
outwash starting @ 7 in river  
& moving toward lake veg. is  
all or mostly PSS.

68-70 PSS / lakeshore

71-80 PSS / H<sub>2</sub>O boundary of the  
small inlet/channel south of DP12  
last pt. should be next to last  
bndry pt taken on 7-16-13

71-74 = RBank

75-80 = LBank

0 DP18 channel

~10 ft wide 1-2 ft deep, v. slow  
flow, H<sub>2</sub>O clear, substrate gravel/sand  
silt w/ some organics, veg banks  
= adj. PSS community  
photo 754

18

7-17-13 Grant Lake -

Arranged to have SMT pick us up @

5:30. Van arrived @ ~6:15

Data QALOC @ house. Coordinated logistics  
to begin corridor mapping tomorrow  
1930 end of day.

11/11

1/4 19

7-18-13 Grant Lake Wetlands

Sunny midupper 60's calm

File = grant lake - 071813

0800 field prep

0830 Boat + car shuttle to outlet  
of Grant Lake

0945 Recon hike to lake outlet

Hiking slow + v. diff. lots of  
downfall

1310 OPO upland

Documenting upland conditions  
at top of v. steep slope above  
proposed powerhouse

Veg = Western hemlock, paper birch

Mountain Ash, Dulcis Club,

False Azalia (*Pernettya fruticosa*)

Fern dogwood,

Typical of upland forest were  
been hiking thru

GPS = 1

Photo = 795-754

0920 upland @ edge of corridor  
Corridor does not encroach →

2/4

7-18-13 Grant Lake Wetlands

in to adj wetland. Typical hemlock  
upland forest  
GPS 2 photos 760-762

GPS 3 = check pt - then deleted  
not necessary.

~~GPS~~ GPS 21 Upland

Doc. continued upl. across  
width of corridor. Cont. Hemlock  
azalea, emp. nig. Kinnickieck  
comp. Steep rugged terrane  
pt ~~at~~ above big basal below  
H<sub>2</sub>O fall.

GPS 4 photos 763-766

767 = flies on my leg!

1500 6P22 R45B3#

Drainage prev. doc. by HDR  
Confirmed location. Use mapped  
lines. 1-2 ft width dry channel  
Large 6" angular rocks  
Steep no H<sub>2</sub>O.

GPS 5 photos: 768-770

Continued upl. on both side  
of drainage no W.L. is

3/4

7-18-13 Grant Lake Wetland

1530 DP12 PSS1/EM1E

Pt taken at drainage - confirming  
prev. HDR pt #112. HDR called this  
an R3UB3H. We are documenting

this as a PSS1/EM1E wetland w/  
a small R3UB3H running down  
the middle. Wetland is ~30 ft

wide, we GPS #16 is the S edge  
of corridor [pics #

~30 ft wide channel in middle, little  
flow, v. soft bottom, ~2" deep; wetland  
ends at GPS #7, still about 30 ft

wide, same conditions. Terraine  
steepens quickly @ GPS 7, wetland  
ends, & channel becomes narrow  
~1 ft wide & similar to channel  
doc. @ OP 22. + continued past the  
of corridor. to the North edge  
GPS 8

pics 771, 772 @ GPS #6 (Station N)

773, 774 @ GPS 7 (Station N)

775-777 @ GPS 8 (DP12) S, N, #20

GIS Note: Hydro line is good for  
both drainages. Add a 30 ft wide

Poly between GPS 6 & 7 in office for  
wetland



22

7-18-13 Grant Upper Wetland

1600 DP13 Upland

Documenting upland comm. ad  
to wetland @ DP11. This <sup>is</sup> common  
is typical of the hemlock upl. forest  
we have been hiking thru ~~the~~  
today. Upl. continues across with  
of corridor ~~→ End of this pt to the~~ then  
wetland,

GPS 9

782  
photos: 778-780 (N, W, E, soil)

Hiked out, back to car w/ map &  
AT/GC in of/capt. to finish day

Conditions V. Steep + rugged

4/4

1 23

7-19-13 Grant-Lake Wetlands

Sunday 70°

\* Ask John Blum if his crew

surveyed the side channels.

McMillan 360-220-6694

0800 Field prep

0900 Start field work

Finishing Notes from 7-18-13 <sup>5/7</sup>

OP20 = upland at edge of corridor  
corridor doesn't encroach into  
adj. mapped wetland. Typical  
hemlock forest common.

GPS 2

photos 760-622

GPS 3 = a check pt - deleted,  
not necessary

GPS 21 = upl. above big punchbowl  
below H2O falls. hemlock, aspen,  
emp. nig, lin. rock  
photos: 763-66

GPS = 4

7

~~9-19-13 Grant Lake W. Hawk~~

7-18-13 continued notes

0P22 Upland - continuation of same  
course.

$$GPS = 1 \Delta$$

Pinote = 783-855

GP23 Upland - continuation of same  
hemlock forest, consider doesn't  
encroach into a d.f. mapped wetland

$\text{GPS} = 11$

photo-780-8

CP 24 ~~at~~ Hydro line on map.

e.p. confirms that we did not  
 obs a channel here; hydro line  
 follows topo. could have  $H_2O @$   
 after heavy rains - but not channel  
 forming. upland

6-PS.12

Photos 788-790 (So. No.

475

~~7-16-13~~ ~~Grand Lake Wetland~~

7-18-13 Note

01225

Can firm end pt. of HDL's P3 into  
at their pt 117 Sweep/Channel 13  
~ 2 ft wide + 10 ft long w/in corridor  
about 13 sub srfs. to the N + S of  
this G-P's location. No wetland,  
just a small wet muddy spot.

Notes: 791-793

Notes: 791-793

7-19-13 Grant Lake Wetland

8/5

Back to 7-19-13 Notes

0945 GPS 26 upland

Pic Glance, alnus, vic, forest

bitten Horn &amp; RR

GPS=1 photos - 794-95

10:15 DP14 Pervasive with a

2 ft (avg) wide meandering R3WB

running thru it. See corridor

map 2 for channel &amp; wetland

boundary lines

Channel, wetland &amp; snake feed

into adj. pre-mapped P501/01B

wetland

GPS = 2 = E. FK start

3 = W. FK start

4 = DP14 &amp; channel merge

5 = channel ends @ corridor

Photos = 794-97 <sup>794-97</sup> ~~DP14~~ <sup>DP14</sup> down @ GPS 3

798-99 W. FK down close @ #4

800-801 DP14 &amp; channel merge

down, up @ GPS 4

802-803 GPS 5, down, close

245<sup>27</sup>

7-19-13 Grant Lake Wetlands

10:15 DP15 upland

Pic Glance, W. ~~glance~~ <sup>glance</sup> bet. Glance

that transitions into a

Pitz Glance, ~~bet~~ <sup>bet</sup> pup upl.

forest. to SW

GPS = 6

photos - 804-807

(SW @ DP14, SE, soils)

1130 OP27 - upl.

Pic Glance, ~~bet~~ <sup>bet</sup> pup. forest confined

environment throughout corridor

GPS 7

photos 809-10

1245 OP28 - down no WL fringe on

R6 or L6. <sup>bet</sup> ~~bet~~ <sup>bet</sup> pup. Glance like up or downStream <sup>W. FK</sup> ~~W. FK~~ <sup>W. FK</sup> this pt.

photos 812-816

GPS 8

GPS = 9 photos 817-822

1300 OP29 upl. adj. Grant Lake

Trail Lake confl. bet. pup,

Pic Glance, ~~ros. asier~~ <sup>ros. asier</sup> ~~dog~~ <sup>dog</sup> oak

fern shield fern &amp; equi arb,

cha. ang. fireweed



3/5

G.L. 7-19-13 Wetlands

1330 OP 38 upl. photo 823-825

Down veg on aerials

High brown cranberry (vib. adic.)

fireweed, geranium, indy fern, rose,

paper birch, oak from pic glance

~~agrostis~~ <sup>lighter</sup> cal can

Area flooded, but is well drained

&amp; appears a common typical of upland

1345 OP 31 - dpland doc no WL

fringe on RB, LB, up or down

stream @ this loc &amp; vicinity

Banks too steep

GPS=11

photos= 826-827

1460 DE 16 upl.

Doc. upland herbaceous comm.

located in various low looking

areas on field map #3

cow parsnip, columbine, hb cranberry

e.g. in ar. ~~agrostis~~ <sup>grass</sup> ~~cal can~~ <sup>cal can</sup>

dog wood

GPS 12 photos of pre-map was this  
828(5), 2930 as a wetland - not  
correct. all upl.

4/5 29

7-19-13 G.L. Wetlands

Soils - thick virginia layer over  
old alluvial material, well-drained

photos 828-32 Soils dry

1430 OP 32 - dry

no wetland

recent

dry, no flow

NE direction

GPS 13

photos - 833-36

1445 GP 33 - sm. active channel

R45B large 2-8" angular rocks

massy, low flow going NE to

SW can see big bald eagle nest

across from fish camp

~ 4' wide avg. No wetland fringe

GPS 14

photo 837-840

1515 OP 34 - doc. upl. at this corner

&amp; the upl. in the drainage that

is at the NW corner of parcel

mapped 1992 wetland to the NE

Typ. Pic glance paper birch

5/5

Grant Lake 7-19-13

azalea, brinnichinua

photo 841-844

GPS 15

1525 0835 over look of wetland

GPS 16

photos 845-46

GPS 17+18 2 boundary pts  
on the big wetland

1630 Back to field truck

AAL data back @ apt

1830 end of day

\* Note: Jean with scraped skin  
minor, but still called in to  
work care to document given  
wet dry conditions

4/31

7-20-13 G.L. Wetlands

\* Grass w/ white delicate seed heads in

H<sub>2</sub>O @ boat area on grant creek side oftrail lake = *Valeriana atropurpurea*

'Mountain haring grass'

\* rhubarb can, corn can = herbbs

0830 gear prep

0800 Start of day

1030 DRI7 PSSS ~~PPEN~~ 11B

S/S EM wetland. Will need to  
edit pre-mapped WL boundary -  
using GPS bndry pts as a guide  
more WL in corridor than  
pre-mapped

GPS = 1 DRI7

photos = 3155-3162

Bndry = GPS 2-11

Note, wetland tapers off into a  
topographic drainage noted at  
yesterday's DP34. We mapped to  
where the wet/moist portion of  
the drainage subs below str



## 7-20-13 Grant Lake Wetlands

1130 DP18 - upl.

Upl. Corridor that surrounds

Wetland @ ~~DP17~~ DP17.

Typical white spruce, hemlock  
paper birch upl. forest w/  
vac ulig. + menziesia (azalia)

emp. nig. understory.

GPS = 12

photos = 31863 - 31869

1145 0836 upl.

Doc. upl. at this loc. was  
DP18 at the datasheet for  
this

GPS 14 → overlooking DP19 & J-L  
photo 3170 - 3175

1200 DP19 ~~DP19~~ ~~PSS314/PEM18~~ ~~PSS314/PEM18~~ ~~PSS314/PEM18~~

Confirming wetland location.

Update pre-map wetland type  
sat. soils data snow site #20  
in topo lows w/ "deep" Aeg.

Update boundary on ~~sat~~ sat. with GPS pt  
the remaining pre-map is correct  
GPS 15 = DP 14.19 updated boundary

photos 3176 - 3182 loc  
see Corridor map #7

## 7-20-19 Grant Lake Wetlands

Note: HDR's pt. 125 is confirmed.

1230 DP20 ~~PSS314/PEM18~~ PSS314/PEM18

Confirming pre-mapped wetland

HDR's pt #123 is in this WL

PSS18 is in the middle surrounded  
by a ring of ~~agrostis~~ <sup>calceol</sup> agrostis, grass, surrounded  
by a ring of marginal bet glau  
& led dec.

Update boundaries on pre map.

using GPS pt &amp; linear field

map #7.

GPS 18

photo 3183 - 3190

3187 - standing in Pen  
ring looking @ DP20

1315 DP37 upland

Typical pine glauc azalia, bet pap  
GPS 3183-19

photos 3190 = upl NW 3189 upl SE

into DP20 wetland

GPS'd updated boundary for DP20

see map #7 too. GPS # 20-23

## 7-20-13 Grant Lake Wetland

1340 DP 21 upland

Hemlock, paper birch, white spruce  
azalea, dogwood upland

GPS 24

photos: 3191-3193

1425 OP 38 upland

Cont. upl. from DP 21 to this

pt. photos looking @ <sup>adj.</sup> Wetland

photo 3194

GPS 25

1430 DP 22 PBN/SS1E

Herbaceous/SS wetland w/ open

stunted spruce trees w/ Adj. PFOE

community immediately <sup>(E)</sup>

GPS 29

photos 3195-3198

\* Update pre-mapped wetland boundary  
& type w/ GPS'd 'boundary' pts & noted  
on corridor map 8

Confirmed upl. @ HDR's pt #122

7/1

## 7-20-13 Grant Lake Wetland

1515: OP 39 PSS 4/1B

Same loc. @ HDR's pt #119. Conf.  
their PSS 4/1B evaluation. Data

sheet looks correct, except we

did not obs. ~~3~~ pie sit ~~at edge~~layers ~~stationary~~ instead of ~~edge~~GPS = 30 <sup>400, observed cal. class (B)</sup>

photos: 3199-3201

1530: OP 40 PFO 4B

Same loc. as HDR's pt 121. Confirming

PFO &amp; reasonable datasheet. Only

change is we see ~~gross~~ <sup>gross</sup> ~~stationary~~~~of edge~~ <sup>year observed cal. class (B)</sup> & saturated 'B' instead of

perm. flooded 'H' conditions.

PFO comm. that borders the

PSS area is transitional ~~on~~

the dry side, but there are

numerous <sup>topps</sup> ~~topps~~ that hold H<sub>2</sub>O

to maintain w.l. conditions.

PFO boundary is conservative

photo 3202-05

GPS = 31

5/735

7-20-13 Grant Lake Wetlands

1545 OP41 upland

Same / similar comm. as DP21

at the approx proposed water line  
for the retention lake ~30% slope  
paper birch / Wht spruce, fern comm.  
GPS 32

photos 206-208 (N, NW, S)

1600 OP42 continued upl.

GPS 33

photos 3209-3211 (N, W, S)

1630 OP43 start of a <sup>moist</sup> vegetated  
swale GPS pts 34-38 document  
the center line - in GIS add a  
8 ft. buffer (4' on each side) to  
capture <sup>soil</sup> soil conditions.

mosaic community of  
sing. can (burnette) equi. arr.  
high bush grass, oak fern  
birch (stressed) + white spruce (stressed)  
agrostoid. can can (35)

We'll call it a PEM1S to be  
conservative.

photos 3212-13

7-20-13 Grant Lake Wetlands

Note: did not see the hydro  
line or the R3mS that HBR  
noted at their pt #120.

Note: update wetland boundary using  
lines on map 8.

~~Deannette~~

Back from field @ 7am

2 hrs of GMLC. GIS work



38

7-21-13 Grunt Lake Wetland

0730 Start field prep.

900 Start hiking

7-21-13 GPS file

1100 0744 upland

Conf. ~~water~~ pic glauc., bet pag.  
 rosn asic, menziesiafer, gymdry  
 (shrub fern) dry dila corn. can,  
 rubs ena

GPS 21

photos = 3214-3215

1115 0745 upl. pre-mapped  
 pt. taken @ hydro line, not a  
 correct loc. for the line. upl. common  
 photos taken to doc. upl. here  
 hmt. alder, <sup>calican</sup> ~~agrostis~~ <sup>sp.</sup> sal. sp.  
 in side channel / eddy across the river  
 GPS = 2

photos = 3216 (downstream), 3217, across.

3218, up; 3219-221 upl. veg at

GPS loc

276 39

7-21-13 Grunt Lake Wetland

GPS 3 = boundary pt. for NE

corner of big wetland See map

7 for edited boundary line

- Note - delete blue hydro line

between big wetland + Grunt

Creek - We walked it

lowest pt. 15 at HDR's pt 120

R34B - ~~note~~ see veg swale

that runs perpendicular

to Hydro line we mapped

yesterday.

Riparian area secondary assessment.

Very complex &amp; diff to map! Will need

to depend on hydro team to map

side channels - not in our scope &amp; v. diff

to map - cannot see easily on or aerial

Will have to simplify mapping to

story w/in budget. Approach will

be to map 'Riparian area' vs,

higher - non-<sup>WTL</sup> riparian, 'Riparian' =

area that is accessed by higher

flow <sup>WTL</sup> & could potentially have

Wetland hydrology. Veg in this

area is more open &amp; dominate

## Grant Lake Wetland

3/16

7-21-13 + cottonwood

by willows + alder. top v. undulating  
so this is really a wetland upl.

mosaic, but no way to accurately

map wet vs upl. portions or even

estimate a realistic % age - maybe

20% / 80% wetland upl in v.p.

area? We will Non v.p. area

is the portion con dominated by

paper birch + white spruce, that are

generally high enough elevation

to be dryer than riparian

area. There could still be some

low area that we miss in

here so we will really need

the hydro teams data (stream

lines + flood flow modeling

results) to see where the

currently goes + where it will

potentially go in the future to

be able to describe potential

riparian wetland effects.

If we come across a wet area

we'll drop a pt., but do not

have the time to map

4/16

7-21-13 Grant Lake Wetlands

bordered the Indry impact

assessment. Will rely on drawn

in map notes for the majority

of our mapping lines

1320 DP23 WL Riparian pt.

permssile + upland mosaic

pt taken on an island between 2

active side channels.

Topo hi veg = cow parsnip, hibiscus, an

alder.

Topo Low veg. is more dom. by agass.

Stat. of eq. arvensis

GPS 4 topo

photos: Low 3229, topo hi 3225-28

1400 GPS 5 Indry WL rip vs non WL

photos: 3230 - 3232 was looking rip

upstream direction

GPS 6 Indry WL rip vs non WL

photos 3233 (rip) - 3234 no WL

Nish 5 is

GPS 7 same type of Indry

photo 3235 (wet) 3236 (non wet)

42

Grant Lake Wetlands 5/16

7-21-13

GPS 8 end of <sup>contour</sup> veg swale -  
connected w/ large WL. see  
map 86 for boundary lines

1430 GPS 9 just above boundary

GPS 9

photos 3238 (top stream), 3239 (across  
3240 (dist.))

1500 GPS 10 = boundary - photo 3241 <sup>looking @</sup> rip  
GPS 11 = rip WL area, area  
of standing H<sub>2</sub>O

GPS 12 = side channel photo  
3242 (top stream) 3243 = downstream

DELETED GPS 13 = boundary - end of rip  
WL

Note: rip WL comm ~~at~~ <sup>described</sup>  
prev. seems to end @ gauge  
station where big side channel  
meets back up w/ main channel  
immediately downstream of  
gauge station the deciduous  
area is much drier.

No. it's  
a little bit  
includer  
in context  
in boundary  
map 86

643

7-21-13 Grant Lake Wetlands

filled back to curb by ~4mm  
had flat tire. fix swapped out  
w/ spare. Drove to Seward for  
groceries - tire repair closed.  
Spare seems to be in good shape

QA/QC + field team coordination  
w/ Botany team - after getting  
back to office.



7-22-13 Grant Lake Wetlands 47

0930 field prep

0945 Start hiking

\* 7-22-13 GPS file \*

0945 Bndry pt. still in WL/non WL mosaic rip. comm.

photo taken @ bndry pt at alder / Spruce comm bndry @ N. side of & photo looking across Grant Lake

GPS 1 photo: 111(S) + 112(N)

GPS 2: bndry - pre-map bndry 13 good. pt taken in side channel that runs along base of topo break - same side channel as GPS 1

1015 DP24 PEN 5512 / Spruce-cottonwood

Data pt. taken at back of 20 mosaic

edges & document continued

alder / cottonwood - Spruce WL / up 1

rip. mosaic. See to po map. +

map #5 for bndry notes, pre-map bndry is good in this section.

2745

7-22-13 Grant Lake Wetlands

\* Note: After walking thru the WL/non WL mosaic, estimate 20% WL/80% non-WL rip mosaic at the upper end where DP 23 was taken just in the greener triangular area that has more active side channels. The rest of the mosaic area that is less green & has more snags in it is more like 10% WL/90% non-WL. These other areas mostly have wetland fringe along side channels.

DP24 - WL doc. in data sheet is

the moist fringe vey the non-WL

is the higher & dryer cottonwood /

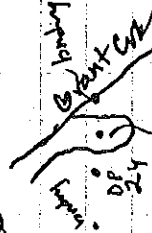
Spruce rip. comm. Soils well drained

so WL comm is limited to those

areas adj. to open H<sub>2</sub>O.

DP24

GPS: 3, 4, 5



Photos: 113 - 117

7-22-13 Grant Lake Wetlands

1115 0P47 upl. riparian.

pt. taken in open green area. This pocket is access by flood H<sub>2</sub>O from lake, but is apparently well drained enough to not dulp. marginal wetlands character is trees that we saw up stream of here @ DP 23 DP24. Key dom by ferns, agros <sup>leafy</sup> ~~off~~, cottonwood. Also dug a pit. Thin org layer over large (6" + angular rock). Org. layer wet were dry.

GPS = 7

photos 118-120

# Note: We Walked thru all of the low lying grassy areas of the corridor between 0P47 & the banks of trail with confirmed that while the open areas are low areas, they are dry / non-wet areas. 0P30 was the lowest area of all of them.

Photos: 126-128

taken at Lake Shore wetlands

0P30

3/7

4/17

7-22-13 Grant Lake Wetlands

1245 DP 25 ~~Pointe-à-Pic~~ <sup>Pointe-à-Pic</sup>

Wetland pt represents the low lying areas at the confl. of Grant Creek. Trail Lake on the N. side of the lake. A side channel wraps around the N + NE side of the island were on. Most of it is outside of our 100' buffer. GPS 8 photos Cottonwood / birch over <sup>story</sup> ~~DP~~ photos 129-131 DP25

132 = looking NW from DP look @

Trail Lake narrows

GPS 9-13 = binding pt3

GPS 14 = DP 26 upland.

GPS 15 = binding pt3

See topo map for binding lines

1315 DP26 upland

pt. representative of cottonwood / Spruce upl. in the riparian dom.

134-138 photos

GPS 14 - 18 binding like 17 but

side channel in topo map 13

~ 15 ft wide flowing to lake

1-2 ft deep. Herb / SIS w/ fringe



# 7-22-13 Grant Lake Wetland

1340 OP48 side channel

GPS 20 DS 35-42.0 param  
photos 139-144 43(up)

1445 OP48 upland

Documenting upland forest conditions @ mouth of canyon on N. side of Grant Crk  
GPS 21

photos 145(up) 146(down) 147(open area on N. side of crk) 148 (microstream)  
Forest cottonwood, white spruce, paper birch w/ aralia, devil's club, <sup>and grass</sup> ~~agrostis~~ understory dry + steep

1510 OP49 cont. upland

photos 149-50

GPS 22

1515 OP50 Upland GPS 23

Correct pre-map to upland. Spruce cottonwood forest - similar to high upl. topo area in the w/ non-w/ riparian mosaic on South side S. side of the river

57

67 49

7-22-13 Grant Lake Wetlands is much wetter.

1520 OP51 Sliver of POMIC on fringe of active channel.  
GPS 24

photos 154 down 155 up stream

1535 OP52 Continued upl.

Steep slopes

GPS 25

photos 156(up) 157 down

1545 OP53 upl. - photo

freq. moister than prev. upl. areas noted above but still upl.

w/ paper birch, spruce, larch, fir, eg. arv. twisted stalk, goats beard, geranium. Soils were moist slightly, not hydric checked in

A side channel filled w/ eg and

GPS 26

photos 158-163

50

7-22-15 Grant Lake Wetlands

1605 OP54 up!

Continued up! slight lower bench  
adj. to P20 is also well-drained  
w/ spruce, current, devil's club, alder.  
higher ground is soft spruce, birch,  
azalia, devil's club.

GPS 27

photos 164-167

1655 OP55 PEM1B

O.P. @ V. small wetland pocket - not  
big enough for a full delineation  
Marked it on topo map. 10'x20'

dimensions. Mainly mossy <sup>all can be</sup> ~~grass~~ <sup>grass</sup> ~~grass~~  
V. small pic g huc <sup>all can be</sup> ~~grass~~ <sup>grass</sup> ~~grass~~

mainly moss &amp; eq. vegetation

GPS 28

photos 168-170

Back to truck @ 1730 GABR back  
@ apartment.

7/1

7-23-15 Grant Lake Wetlands

0800 field prep

Flying up to lake today.

0900 Scheduled flight w/ SMA

\* Note this is only a one-way  
flight - invoice shows just be  
\$350. We are hiking out tonight  
waited ~ 1 1/2 hrs before we left  
(WPM 10:30)

11:00 At lake - boat review w/ Robison

11:30 Start lake recon

photos ~171-218 = lake photos  
lots of photos  
end of lake

12:30 OP56 GP

pt taken @ alluvial/colluvial fan dep.

Correct pre-map to upland. Fan is

steep + loose gravel cobble rocks.

veg is nearly 100% alder (*Alnus viridis*)FAC. minor veg comp. firwood (*betula*

+ angustifolia) cottonwood or large

Sal. alba. No organics in soil. No

primary hydrology indicators so

no potential for hydric soils.

veg is about 2x vertical ft above

current H2O line - bare gravel structures

2/6

## 7-23-13 Grant Lake Wetlands

on  
Adj. East side of farm, back-gate  
to H<sub>2</sub>O. where farm is not active veg  
is thicker & is a alder, white spruce  
cottonwood div. w/ Deschampsia  
us pitosa

photos: 219-225

1320 OP57- upl.

Documenting open alder / white  
spruce community. Understory of  
sheild fern, corn can, rhubarb, chag  
Des cesp, ribes laurifolium.  
Comm. is moist but not wet  
checked soils ~ 10" of minerals,  
colors faint, somewhat moist,  
no saturation.

GPS 2 photos 226-230

1340 GP58 - PSSIC / R3503

Documenting a PSSIC fringe around  
a upper perminial cobble stream drainage  
wetland fringe is ~ 3ft on both sides  
see map #23 for boundary.

3/6 53

## 7-23-13 Grant Lake Wetlands

Veg = alnus vir. shield fern, barabette  
rhub chag, corn can, ~~agrostis~~ <sup>calcare</sup>  
Similar to ~~open~~ OP57 coming,  
but has a primary hydro indicator  
& barabette,  
GPS 3, photos 231-234.

1415 DP27 PEMIE

Herbaceous wetland fringe  
GPS 4 = DP 546 = E & E boundaries  
In GIS take use E & W boundary + 5 ft  
elevation rise for wetland boundary  
(Guernsey)  
photos 235-236

1430 DP28 upl.

Alder fringed  
w/ upper layer of open gravel cobble soils,  
w/ no hydrology map 19  
GPS 7

photos 237-239

1500 GP28 PEMIE

Map 18  
Wetland fringe @ average 243  
Similar sp to DP27 but also  
Cur. mor. usii & monken fanner

2/6

## 7-23-13 Grant Lake Wetlands

on  
Adj. East side of farm, back-gate  
to H<sub>2</sub>O. where farm is not active veg  
is thicker & is a alder, white spruce  
cottonwood div. w/ Deschampsia  
us pitosa

photos: 219-225

1320 OP57- upl.

Documenting open alder / white  
spruce community. Understory of  
sheild fern, corn can, rhubarb, chag  
Des cesp, ribes laurifolium.  
Comm. is moist but not wet  
checked soils ~ 10" of minerals,  
colors faint, somewhat moist,  
no saturation.

GPS 2 photos 226-230

1340 GP58 - PSSIC / R3503

Documenting a PSSIC fringe around  
a upper perminial cobble stream drainage  
wetland fringe is ~ 3ft on both sides  
see map #23 for boundary.



54

7-23-13 Grant Lake Wetland  
adj. to fireweed, agrostis, raspberry,  
higher elevation

1530 GP60 PEM/SSI/E

OP pt. to doc. typical herbaceous  
wetland fringe. Sim. to DP 27  
community w/ some alder at  
the fringe map 15  
GPS 9

photo: 244-245

fringe continues a little further  
west - see drawn-in polygon map  
15

1535 OP61 PEM/E

See DP 27 - similar fringe common  
mainly carex. narrow fringe  
see estimated boundary on map. It  
fringe is 5 ft deep on avg.  
GPS 10 took pt from 1530  
photos 246-247.

1600 OP62 PEM/E

Same fringe as we've seen  
before see map 11 & 1029

4/6

7-23-13 Grant Lake Wetland

GPS = 11, photos 248-249

11615 GPS 12 photo 250-251 upland

OP63 Documenting that the  
altered fan on map 9 is not  
the pre-mapped PSS1B - it is an upland  
sim. to OP56 w/ steep well  
drained alder comm. This area  
also has alot of fireweed & low  
parsnip. Note the narrow PEM  
fringe of equisetum drawn on  
map 9.

11645 OP64 Documenting that this  
GPS 13 photos 254-255

is an upland Alder dominated  
w/ large white spruce, fern &  
equisetum; a talia

see map 3 there is a very  
small drainage coming out w/

a N. narrow wetland fringe

this area pre-mapped as

PSS1B is to well drained &

elevated to be wetlands

previously ~~mapped~~

5/6

7-23-13 Grant Lake Wetlands  
1730 Off of lake. Will hike out to  
make sure we know our way  
out on foot + also to see if hiking  
will be faster than flying w/  
SMA.

1800-1900 Hiking, then QA/QC  
back at apartment.

\* Note - briefly met Mike Slezeth  
& Brad ~~xx~~ <sup>young</sup> ~~xx~~ <sup>xx</sup> morning  
before going to SMA.

7-24-13 Grant Lake Wetlands

See GPS file 7-24-13

0800 prep for field

0830-1000 Data QA/QC while coordinating  
w/ fisheries for a <sup>boat</sup> ride to trail

(Wike was to avoid bush-watching  
the established trail section).

Hiked to lake

1045 DP29 PEM18/SS1E

Wetland fringe community

Will refer to this common as we

progress west along N. side of lake

pt is located on the beach, but

Wetlands extends back (see maps)

Area is a steep w/ a couple of

small R4SB drainages. Alder

dominated shrub layer. Large

Wht. spruce + cottonwood roughly

define upland edge

Seasonal flooding from lake +

drainages

GPS 1 photo 258-259

1115 DP30 Up1em2

pt. taken on edge of DP29 wetland

## 7-24-13 Grant Lake Wetlands

DP 30 (cont.) is in the moister part of this upland - adj. to a small drainage. See map 3 for boundary Cottonwoods / Spruce - define edge GPS 2 photos 240-245.

## OPL65 PEMIE

pt taken in H<sub>2</sub>O b/w island + N. side to document des. camp. <sup>can see</sup> agrostis ~~st~~ + carex wetland fringe as mapped on map #2. GPS 3 photo ~~246~~ 246-248 looking East (island on Rt).

Note, No close up map of islands. We beated around it - all be rock to H<sub>2</sub>O, except for one tiny fringe on West side of island - mapped on lake index map, + the small fringe mapped on map #2

Note PSS1B pre-mapped on map #1/lek is upland. All well drained alder/cottonwood spruce

## 7-24-13 Grant Lake Wetlands

Note PSS1B pre-mapped on map #5 is an upland. Well drained alder community w/ fireweed, cow parsnip <sup>can see</sup> agrostis herb comm. Veg site ~ 3 ft above water on vertical bank. large trees in aerial that flank the alder are paper birch + cottonwoods + mature white spruce Same w/ map #4

## 1255 OPL61 UPland

Taken from boat to document upland to the N + S of this pt. Narrow alder fringe (elevated) w/ mature white spruce + cottonwoods photo 249(S) + 270 (N). GPS 4.

## 1325 OPL67 PEMIE

Wetland fringe of agrostis + carex that were been seeing. Typical. See map 58

photo ~~249~~ 277-279 GPS 5



## 7-24-13 Grant Lake Wetlands

41

1340 DP31 ~~PEM1551B~~ <sup>DISSENT</sup> ~~PEM1551B~~ <sup>PEM1551B</sup>Salix | Carex - <sup>carex</sup> ~~agrostis~~ Wetland  
at historic outlet as mapped on  
p. 58.

GPS 6 photo 280-284

photos of veg & old outlet channel  
Channel narrows to about 1-2 ftH<sub>2</sub>O looks stagnant WL veg  
on both sides

1400 DP32 Upl.

Wht. Spruce / Hemlock + emp. nig.

common. Distinct topo break btwn

WL @ DP31 + this pt + surrounding  
uplands.

GPS 7 photos 285-293

Note on map 55, little to

no herbaceous fringe @ historic

break outlet, not sig. to map

one small strip mapped on

map 54

## 7-24-13 Grant Lake Wetlands

0530 0P68 PEM1551B

Obs. pt. to document herbaceous  
wetland fringe of agrostis  
humilis, stinging nettle, lady  
fern + alder. Marginal  
community + spotty w/ undulating  
topo forms various unactive

drainages in GIS, capture the

1st 3 ft of elevations on

this fan. See map 49

GPS-8 photos 294-95

See Map-49

This fan, compared to <sup>the rest</sup> ~~most~~majority of the older ~~active~~ <sup>active</sup> fan

has some, thus including the

13 ft of vert. into the wetland

0P68 294-301 category

0P68

point end of fan photo 302

Note See Map 46 Drew  
in small PEM1B then next  
is upland. V. steep well  
drained after slope

1625 O P 69 Perm 55 B  
Photo 303 GPS9 Obs. pt

to doc, small wetland + spring

up! wht. spruce, hemlock, led.

See map.

1435 DP 33 PEMI ~~1736~~

GPS 10 photos 304-308

tribriculata dominated wetland

Standing  $H_2O$   $1/2$  15 minutes

flooded the back  $\frac{1}{2}$  of the WC

is saturated & likely of un-flooded

See map 40

1700 DP34 upland

6-PS II photo 309-314

Wht spruce / It-em back-frost

See virep 40.

Back to apt @ 1900, 6A/0C

then end of day

7

617483

GRANT AVE

consati hidro

Field Book #1071



"*Put in the Rain.*"

# ALL-WEATHER

LE

No. 353N



FIELD BOOK #2 of 2  
GRANT LAKE  
WETLANDS

0178583



*Rite in the Rain*

ALL-WEATHER

**METRIC FIELD**

Nº 363

2/6

7-25-13 Grant Lake Wetlands

Next DP=35, OP70, photo 315

0730 prep for field

0800-1000 Drive boat - lake w/ safety meeting, coord. boundary w/ state for set

10:30 OP70

Rugged terrain - not going to hike down to H<sub>2</sub>O - too steep & unsafe for crew

GPS=1, photo 315-320

Below

1050 DP35 ~~PEM~~ PEM1PSS1EJB

Outlet at lake, same area as

HDR's pt 107. We are likely seeing drier conditions, thus different hydro indicators. Various small channels prominent. Topo rises sharply at the source line, this is the

upl/WL boundary. Alder is included in WL, they are low-lying Alder

Salix ~~area~~ forms a narrow fringe around PEM corner

GPS 2 photos 321-323

See map #13 for updated boundary line

GPS 3-5 = updated boundary pts

2/6

7-25-13 Grant Lake Wetlands

11:15 DP30 upl

Documenting upl surface/height w/ lidee. Cornish that surrounds DP35 Wetland

GPS 6 photos 341-349

11:30 OP71 - photo pt @ river @ bank of outlet. panoramic photo series. Start <sup>(N)</sup> looking @ river @ side of outlet moving W, S, E + back to N. photos capture top WL & upl @ DP 35+36 GPS 7 photos 340-345

11:45 OP72 - proposed dam structure upland immediately up/downstream on both sides of creek GPS 8 346-350

11:50 OP73

Doc bank conditions GPS 9

photos 351-353 downstream working up

See map #13 for wetlands of <sup>(N)</sup> bank of creek

12:00 OP74

Doc Bank conditions GPS 10

photos 354-358 down to upstream

See map #13. photo series

Return to River

3/6

7/25/13 Grant Lake Wetlands

12/5 GP75

Doc. bank conditions

See map 13

photo: 359-461 GPS 11

Steep banks both sides - upl.

1325 DP37 PFO48 (PFO118)

pt. taken @ HDR's P#110. HDR called this a PFO48. This is a moist drainage &amp; would not necessarily meet the

hydro indicators but HDR observed subs conditions so we will include this wetland in our map. ~~But HDR~~ ~~conditions~~ This is a moist area but

not wet under current conditions. Will be conservative &amp; still include this as a wetland. Boundary on map pt. loc - 12 averaged. Pt. located

in a thick forested area, mossy, N. facing slope. HDR's pt. was taken late June 2010.

GPS 12 photos 362-366

1340 DP38 upl. (see DP 36 data sheet)

also accept more false aerials, use

web dec. trans DP36.

GPS 13 photos 347-369

4/6

7/25/13 Grant Lake Wetlands

GP76-83 (P37) P3WB (P3)

pt. taken at head to line hydro

line is correct. HDR pt 109 is downstream

Channel is defined steep 22 ft wide avg steep vertical banks 2 ft high

SD only moat, but not wetland

veg on side. Angular rock bottom

6" - 1 ft diameter. empty, tumbling

H2O slow trickle, flowing down

channel - w/in wider upland

forested dully.

GPS 14 photos 371 (dup) - 372 (dup)

373 (streambed)

1430 DP39 PSS (P11E)

pt. taken along a running trib

to lake P35B. See map 12 for

boundaries. Pt. is part of a larger

wetland that transitions into a

more "C" type of hydro indication

GPS = 15

Photos = 374-377

1450 DP40 upl.

Typ. wetland, false aerial, bilberry

upl. - too many roots &amp; down fall to do pit. Pt. is right next to wetland. GPS 16 photos 378-79.



514

7/25/13 Grant Lake Wetlands

15D5 6P77 ~~R355~~ R3V3 (B)

the conf. of the K3SB noted @

DP39 will take. Note change

pkc-map pmlz to pssc aldrc

GPS 17 Photo 350-381

1525 DP41 wpl. - marginal areas

GPS 18 photos

Grossly calcareous for weed control

① S. end of the lake

82-87 soils, SE W

if existing = up! potential for

member board of this comm. to

meet w/ conditions w/ problemator

soils overlying clayey glacial till  
units. The sand

6W pit ~ 3 vertical ft above

current 420 live. Wave live is ~

2 vert. pt above water line.

do 1/4 Circle Dry pit to 20+ inches

Nb<sub>2</sub>O<sub>5</sub>, post mort

Conditions have been dry

In 6/5 include very hot 50/50

3 Vert. ft of identical data in a few ms

Grant Lake Wetlands 7-25-13

5744 45

1745 Crew out of Field Data at all

then end of day (12 hrs)

7-26-13 Grant Lake Wetlands

1/2

0745 field prep

boat - hike - boat to lake  
GPS file 67413

1015 OP 78 up

Documenting upland

alder, nettle, callar community.  
veg. beach is elevated ~ 4 ft  
above H<sub>2</sub>O

GPS 1 photos 387-389

we walked the beach along  
the width of the alder commu

that wraps around the SE

corner of map 51 - it's all

well drained, elevated uph

alders, nettle, elderberry

dwarfs clads, currenty call cam

boats beach. Elevated bank ~ 4 ft

above current H<sub>2</sub>O

photos 391-92 photos @ SE

corner of commu

1105 OP 79

photo of H<sub>2</sub>O fall upland

GPS 2

photo 393-95



2/2

7-26-13 Grant Lake Wetlands

1115 OP 80 PSSIC \* Note GPS data not

Narrow PSSIC fringe collect-  
alder, sedge, etc. - bare clay. map

Further back here at base of

detached mangrove from we

See along tree vert of the shore

photos 396-399

See notes on field maps

35-40 for notes &amp; small WL

inclusions 442

1202081 - PSSIC EM 1 E

GPS 3 photos 400-402

Narrow alder, carex & ~~agrostis~~ <sup>see app 10</sup>

Fringes in back water area. See

map 39 for bounding

Area were seen - a pair of loons.

1215 OP 82 - PSSIC

GPS 4 photos 403-404

Carex sedge low lying

protected beach similar to DP 83

Remains in day: 2 flights to get

boat + gear out of lake - anchor

boat to trail, hiked/boat to

car. Back to apt to GHAC

7/27 - will go back to anchorage ~~later in the day~~

Robertson & Co. London.

7-26-13 Grant 'aka Wetlands







**Photo A.2a-1.** Representative photo of an herbaceous dominated depressional wetland. Photo taken at DP14 (PEM/PSS1E) on 7/19/13.



**Photo A.2a-2.** Representative photo of an herbaceous dominated lacustrine fringe wetland. Photo taken at OP86 on 7.24.13.





**Photo A.2a-3.** Representative photo of an herbaceous floodplain forest & scrub dominated riverine wetland on Grant Creek. Photo taken at OP51 on 7.22.13.



**Photo A.2a-4.** Representative photo of an herbaceous floodplain forest & scrub dominated riverine wetland in the complex wetland/upland mosaic associated with the Grant Creek side channels. Photo taken at DP23 on 7.21.13.





**Photo A.2a-5.** Representative photo of scrub-shrub dominated depressional wetland. Photo taken at DP17 on 7.20.13.



**Photo A.2a-6.** Representative photo of scrub-shrub dominated lacustrine wetland. Photo taken at DP04 on 7.16.13.





**Photo A.2a-7.** Representative photo of scrub-shrub dominated riverine wetland. Photo taken at DP39 on 7.25.13.



**Photo A.2a-8.** Representative photo of a scrub-shrub floodplain forest & scrub dominated riverine wetland. Photo taken at DP02 on 7.16.13





**Photo A.2a-9.** Representative photo of a scrub-shrub floodplain forest & scrub dominated riverine wetland in the complex wetland/upland mosaic associated with the Grant Creek side channels. Photo taken at DP24 on 7.22.13.



**Photo A.2a-10.** Representative photo of a forest dominated slope wetland. Photo taken at DP37 on 7.25.13.



**Photo A.2a-11.** Representative photo of an open water lacustrine waterbody. Aerial photo of Grant Lake looking west towards narrows, taken on 7.16.13.



**Photo A.2a-12.** Representative photo of an active riverine waterbody. Photo of Grant Creek at OP45 taken on 7.21.13.





**Photo A.2a-13.** Representative photo of non-vegetated and intermittent/ephemeral (dry) channel areas associated with Inlet Creek on west end of Grant Lake. Photo taken on 7.17.13.



**Photo A.2a-14.** Representative photo of an intermittent/ephemeral (inactive) riverine waterbody. Photo taken at OP32 on 7.19.13.

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## **Appendix 3: Wildlife**

Appendix 3a: Breeding Landbird and Shorebird Data

Appendix 3b: Northern Goshawk Data

Appendix 3c: Wildlife Related Materials





Appendix 3a. Breeding Landbird and Shorebird Data

June 15-16, 2013 Breeding Bird Surveys

June 15-16, 2013 Breeding Bird Point Vegetation Data

May 21-22, 2013 Breeding Bird Surveys

Photos A.3a-1 through A.3a-14: Breeding Bird Point Vegetation Pictures



**ALMS****SURVEY DETAILS**

(Circle appropriate values)

Length of count (min): 3 5 8 10 other \_\_\_\_\_Spacing between pts (m): 250 500Observers rotated among pts: yes noDouble-observer method used: yes no

Species counted in restricted radius (\_\_\_\_m): \_\_\_\_\_

Species excluded from point counts: \_\_\_\_\_

**OBSERVER INFORMATION**Name: ANAL R ASJMI

First name Middle initial Last name

Affiliation: ERM ALASKA, INC.Address: 748 GAFFNEY RD. SUITE 102City: FAIRBANKS State: AK Zip: 99701Tel: 907-458-8273 email: ANAL.ASJMI@ERM.COM**SURVEY EXPERIENCE (# years):**Bird surveys X Distance estimation 8+ Birding in Alaska 15+**CONTACT INFORMATION**

(If different)

Name: \_\_\_\_\_

First name Middle initial Last name

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Tel: \_\_\_\_\_ email: \_\_\_\_\_

**DAILY WEATHER AND ROUTE**Land unit: SPRANT LAKE JUNE 2013

Block number: \_\_\_\_\_

Block name: \_\_\_\_\_

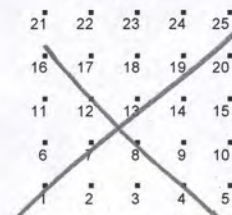
Date 061513

(mm-dd-yy)

	Start	End
Time	<u>0458</u>	<u>0831</u>
Temp	<u>40°F</u>	<u>50°F</u>
Wind	<u>0</u>	<u>0</u>
Sky	<u>0</u>	<u>0</u>

°F/C

Daily route:



Show path between survey points each day. Circle points done by this observer if observers were rotated.

Date \_\_\_\_\_

(mm-dd-yy)

	Start	End
Time		
Temp		
Wind		
Sky		

°F/C

Daily route:

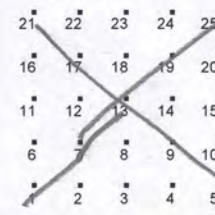
Date 061613

(mm-dd-yy)

	Start	End
Time	<u>0458</u>	<u>0818</u>
Temp	<u>47°F</u>	<u>50°F</u>
Wind	<u>0</u>	<u>0</u>
Sky	<u>0</u>	<u>0</u>

°F/C

Daily route:



#9, #6, #5, #4  
#3, #2, #1

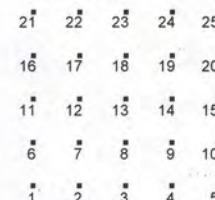
Date \_\_\_\_\_

(mm-dd-yy)

	Start	End
Time		
Temp		
Wind		
Sky		

°F/C

Daily route:





**ALMS****LOCATION DATA**GPS type & no: \_\_\_\_\_  
GPS datum: \_\_\_\_\_Land unit: GRANT LAKE  
Dates: 5 & 16 JUNE 2013Block number: \_\_\_\_\_  
Block name: \_\_\_\_\_

Waypt #	Pt	Latitude (N)								Longitude (W or E)								Location error (m)	Elev (m)	Altim GPS Map	Moved FROM orig pt		Photo		Notes about point and survey markers (give reason if point moved or inaccessible)	
		d	d	d	d	d	d	d	d	d	d	d	d	d	d	Distance (m)	Bearing				#	Dir				
	1																									
	2																									
	3																									
	4																									
	5																									
	6																									
GRANT LAKE	7	6	0	4	5	7	1	6	1	4	9	3	5	2	4	0										
	8																									
	9																									
	10																									
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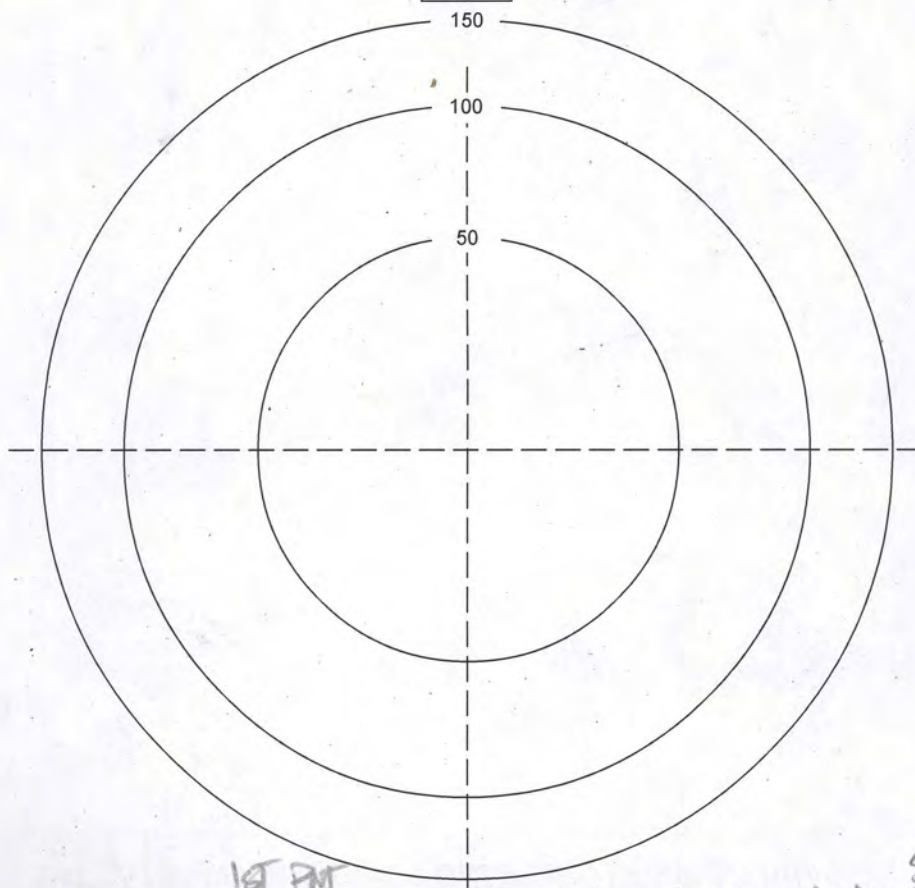


## ALMS MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GL # 7 + 20  
Observer: ARA - RTB

Date: 15 JUNE 2013  
Time start: 17459

Direction  
50° MAG



Species between this and previous point: OCMA; NCMA; VATH; AMD; HET7

Non-landbird species present but not counted:

Mammals: MOOSE DROPPINGS.

Notes: PNT #7 WAS INUNDATED WITH CREEK - GOT AS  
AS WB COULD = 2CM TO SSE.

USGS Alaska Science Center May 2004 *NEW CODES, TAKEN.*

CREEK VERY LOUD - HARD TO HEAR ANYTHING.

## LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

START: 40°F SKY-0 W-0



### MAP OF BIRDS DETECTED DURING SURVEY

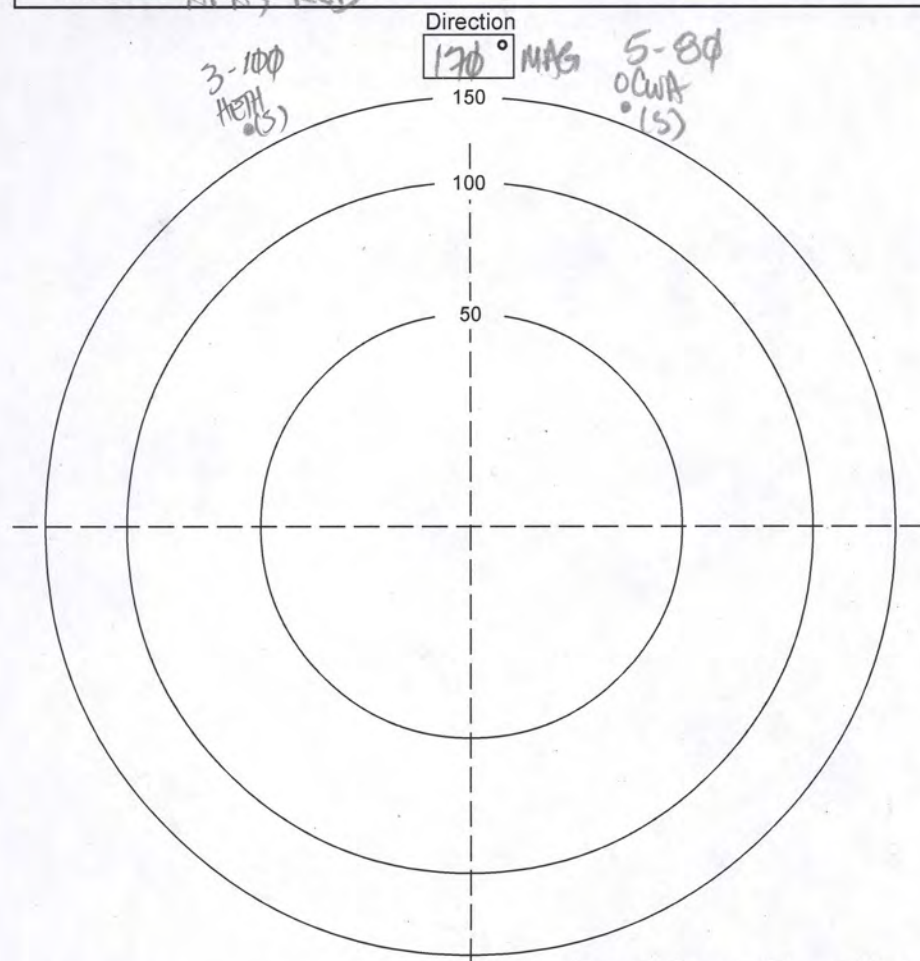
Block #: GRANT LAKE

Point #: G1 # 8

Observer: DOM EJB

Date: 15 JUNE 2013

Time start: 1520



Species between this and previous point: HOTA; OCWA; WWA; GLCH;

Non-landbird species present but not counted: 0

Mammals: 0-

Notes: Chlorine sm. very loud.

## LIST OF BIRDS DETECTED DURING SURVEY

[illegible]



















## ALMS MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE

Point #: GL #14

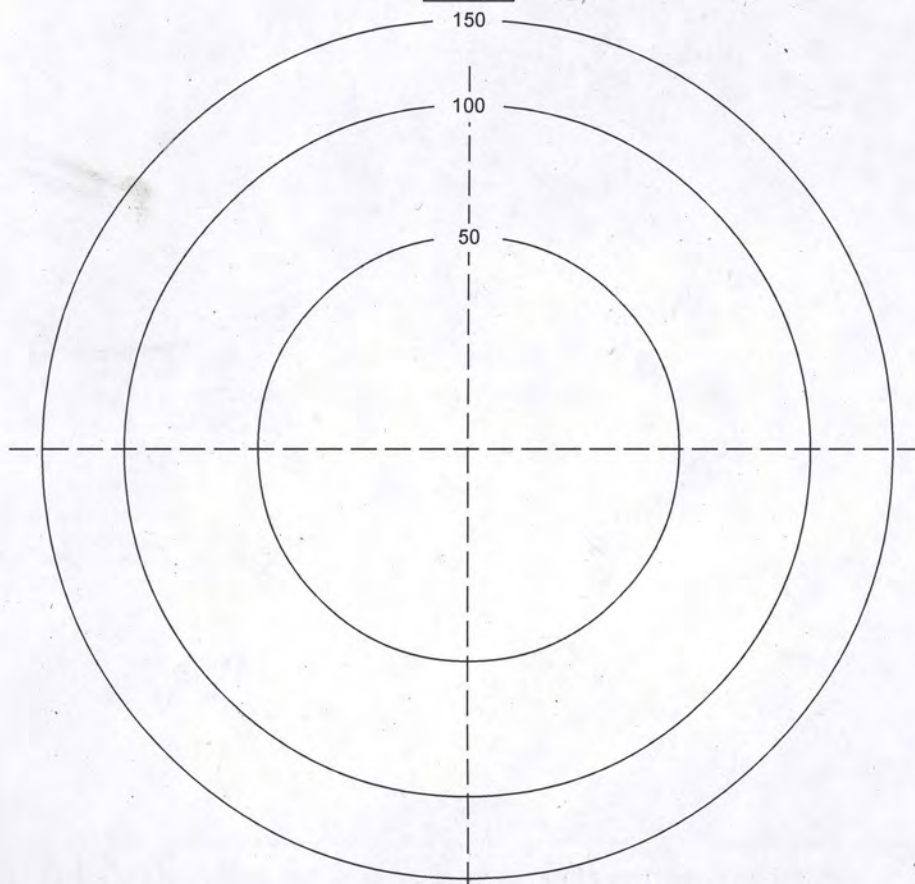
Observer: HEA, RJB

Date: 15 JUNE 2013

Time start: 0821

### Direction

340° MAG



Species between this and previous point: HATH; RBME; VATH;

Non-landbird species present but not counted: \_\_\_\_\_

Mammals: \_\_\_\_\_

Notes: CR VERY LOUD!! COULD NOT HEAR ANYTHING!!

USGS Alaska Science Center May 2004

BIRDS - HEARD 100M AWAY FROM PIT - REKI; HETH; WIWA

## LIST OF BIRDS DETECTED DURING SURVEY

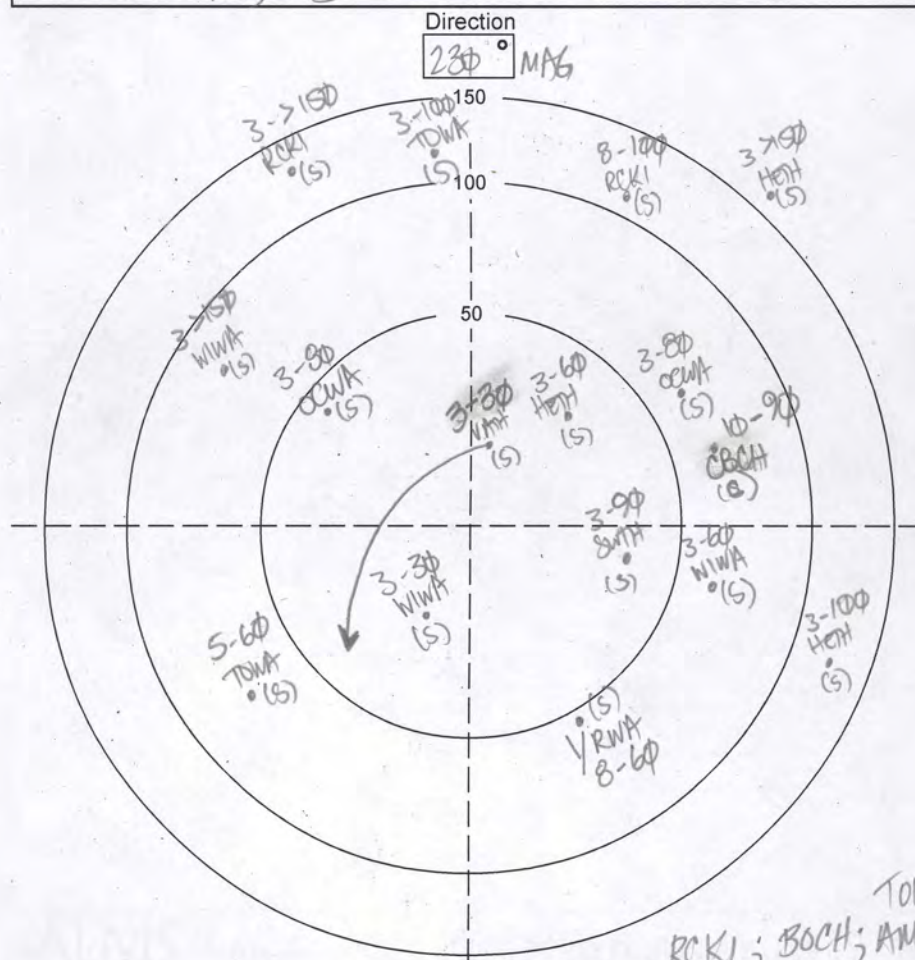
[illegible]



## ALMS MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GL#9  
Observer: APA; RJB

Date: 16 JUNE 2013  
Time start: 0158



Species between this and previous point: NOVA; HPA; SOTA; OWA; WVA;

Non-landbird species present but not counted:

Mammals: BEAR SCAT ; MOOSE DROPPINGS.

Notes:

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

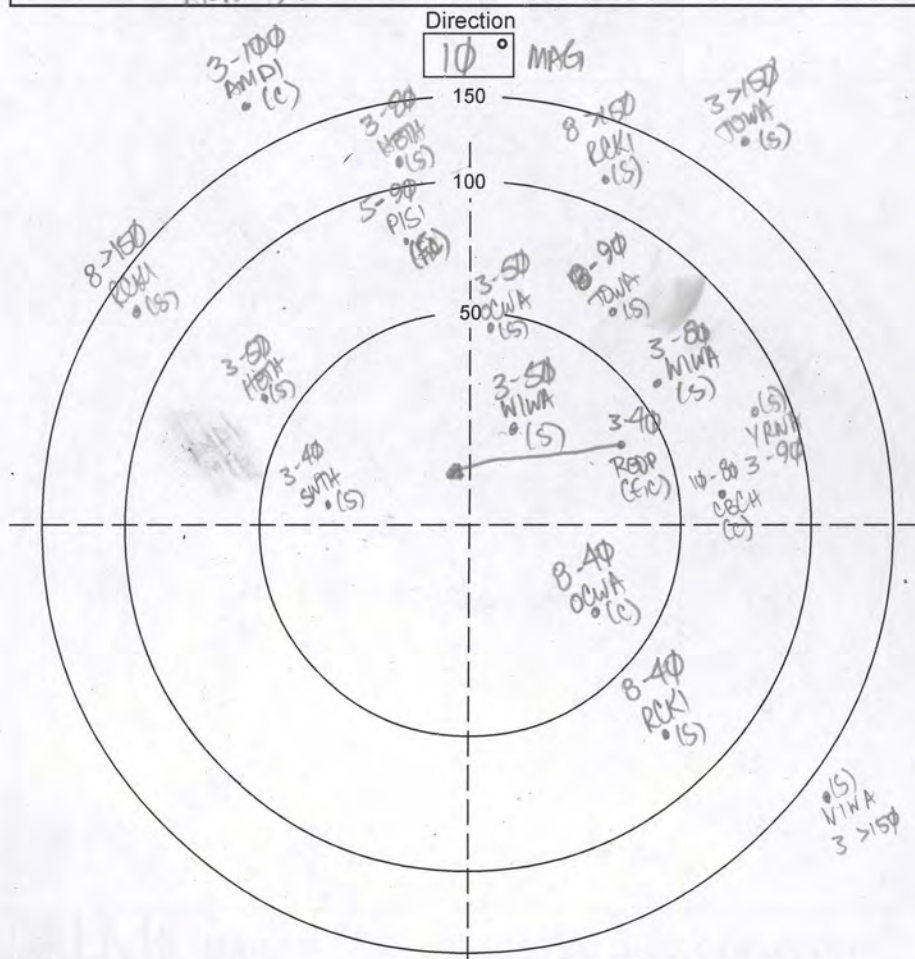


# ALMS

### MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GLOB  
Observer: APA - RJB

Date: 16 JUNE 2013  
Time start: 10520



Species between this and previous point: RCKI; TONK; DCWA; HETA;

Non-landbird species present but not counted: \_\_\_\_\_

Mammals: \_\_\_\_\_

Notes: \_\_\_\_\_

USGS Alaska Science Center May 2004

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

PK. VATH 5-30



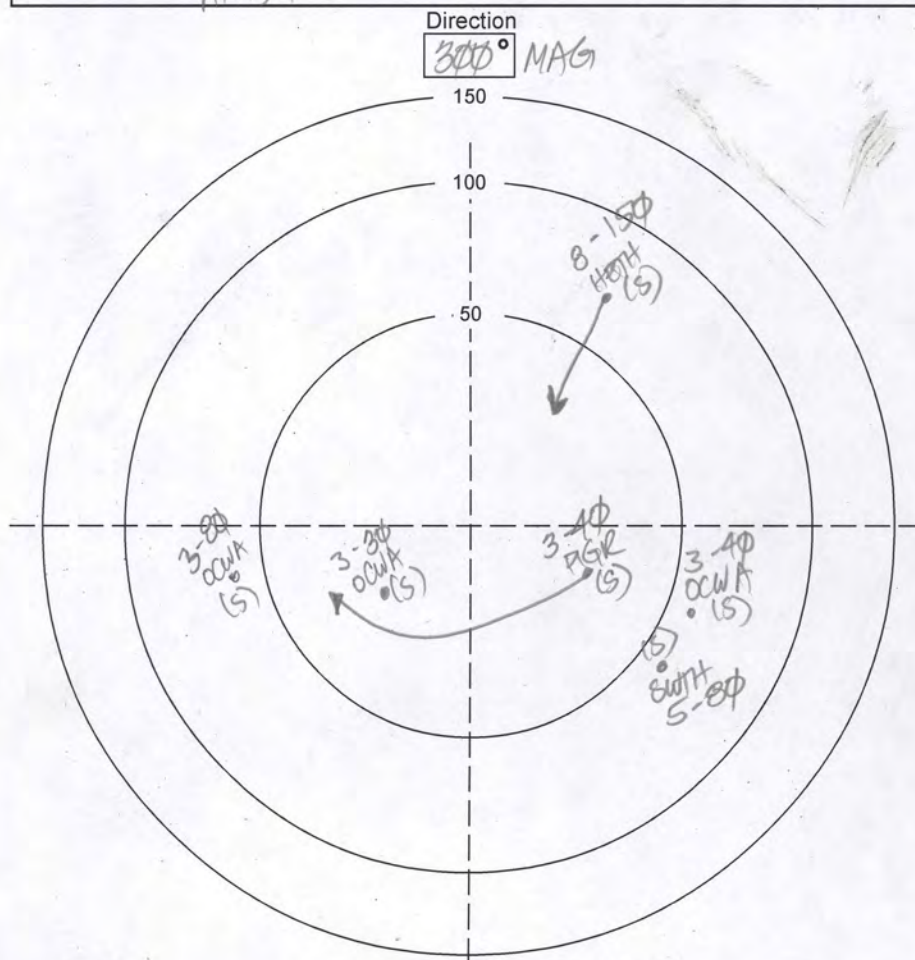




**ALMS** MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GL#4  
Observer: JPA: RJB

Date: 16 JUNE 2013  
Time start: 0624



Species between this and previous point: HERR; PGR;

Non-landbird species present but not counted: 0

Mammals: 1

Notes: CR 1500

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]



# ALMS

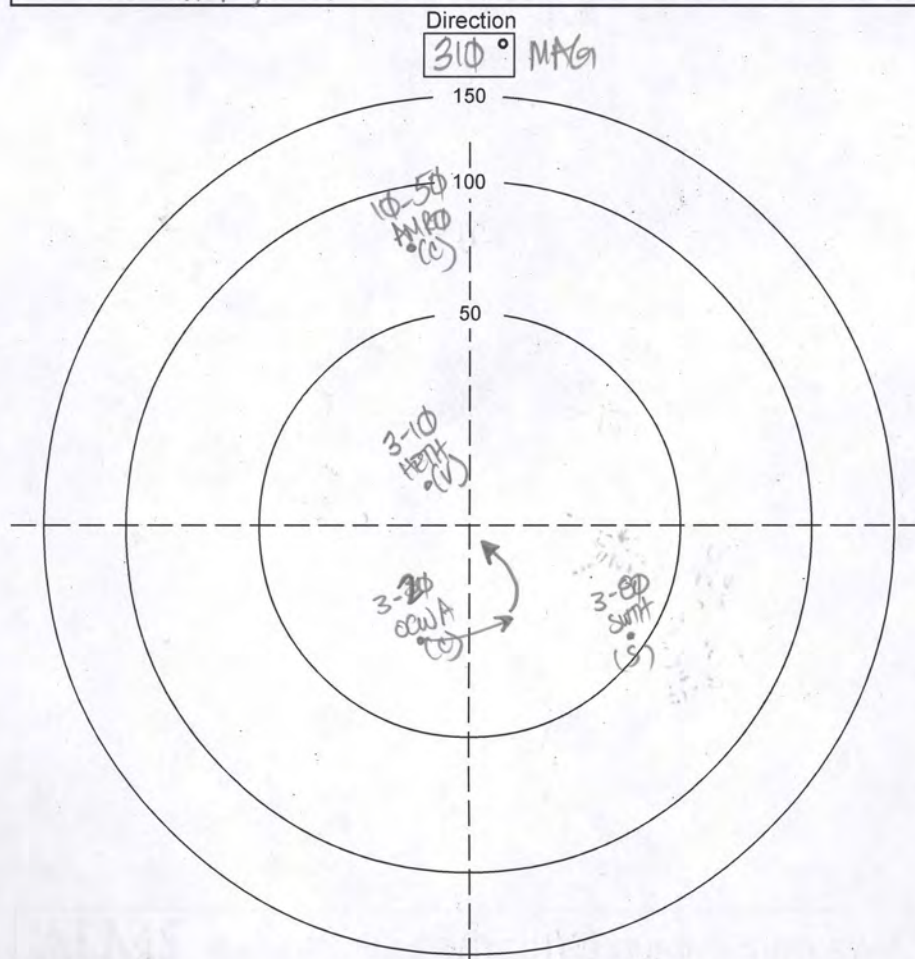
### MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE

Point #: GL#3

Observer: ARA: RJB

Date: 16 June 2013

Time start: 11:51

Species between this and previous point: RAWA's Herp

Non-landbird species present but not counted: 2

Mammals: MOOSE HAIR:

Notes: CR VERY LOUD

## LIST OF BIRDS DETECTED DURING SURVEY

[illegible]



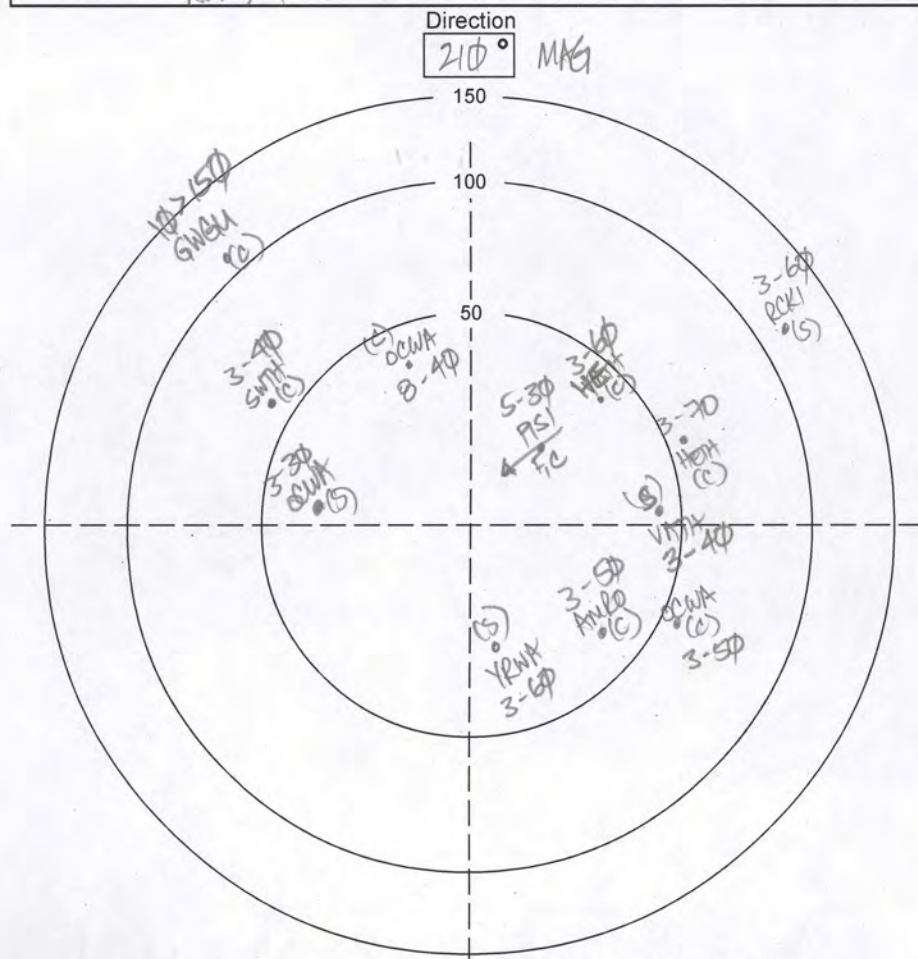




## ALMS MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GL#1  
Observer: AA, RJB

Date: 16 JUNE 2013  
Time start: 11:00



Species between this and previous point: VRWA's, DCWA's, BOCH's

Non-landbird species present but not counted: 0

Mammals: 0

Notes: CHR NOISE (LOTS!)

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

Temp = 50°F S-Ø #7  
END: 0818 W-Ø

# ALMS

## BIRD AND MAMMAL SUMMARY CHECKLIST

Land unit: GRANT LAKE

Block number: \_\_\_\_\_

Block name: \_\_\_\_\_

Dates: 16-17 JUNE 2013

Observers: ARA ; RJB

Total effort: \_\_\_\_\_ hrs \_\_\_\_\_ km

☐ RTLO Red-throated Loon  
☒ PALO Pacific Loon  
☐ COLO Common Loon  
☐ HOGR Horned Grebe  
☐ RNGR Red-necked Grebe  
☐ PECO Pelagic Cormorant  
☐ TUSW Tundra Swan  
☐ TRUS Trumpeter Swan  
☐ CAGO Canada Goose  
☐ GWTE Green-winged Teal  
☐ MALL Mallard  
☐ NOPI Northern Pintail  
☐ NSHO Northern Shoveler  
☐ AMWI American Wigeon  
☐ GRSC Greater Scaup  
☐ LESC Lesser Scaup  
☒ HARD Harlequin Duck  
☐ LTDU Long-tailed Duck  
☐ BLSC Black Scoter  
☐ SUSC Surf Scoter  
☐ WWSC White-winged Scoter  
☐ COGO Common Goldeneye  
☐ BAGO Barrow's Goldeneye  
☐ BUFF Bufflehead  
☒ COME Common Merganser  
☒ RBME Red-breasted Merganser  
☐ OSPR Osprey  
☐ BAEA Bald Eagle  
☐ NOHA Northern Harrier  
☒ SSHA Sharp-shinned Hawk  
☐ NOGO Northern Goshawk  
☐ SWHA Swainson's Hawk  
☐ RTHA Red-tailed Hawk  
☐ RLHA Rough-legged Hawk  
☐ GOEA Golden Eagle  
☒ AMKE American Kestrel  
☒ MERL Merlin  
☐ GYRF Gyrfalcon  
☐ SPGR Spruce Grouse  
☐ BLUG Blue Grouse  
☐ WIPT Willow Ptarmigan  
☐ ROPT Rock Ptarmigan  
☐ SACR Sandhill Crane  
☐ BBPL Black-bellied Plover  
☐ AMGP American Golden-Plover  
☐ PAGP Pacific Golden-Plover  
☐ SEPL Semipalmated Plover  
☐ BLOY Black Oystercatcher  
☐ GRYE Greater Yellowlegs  
☐ LEYE Lesser Yellowlegs  
☒ SOSA Solitary Sandpiper  
☒ SPSA Spotted Sandpiper  
☐ UPSA Upland Sandpiper  
☐ WHIM Whimbrel  
☐ SESA Semipalmated Sandpiper  
☐ WESA Western Sandpiper  
☐ LESA Least Sandpiper  
☐ ROSA Rock Sandpiper  
☐ DUNL Dunlin  
☐ WISP Wilson's Snipe  
☐ RNPH Red-necked Phalarope

☐ PAJA Parasitic Jaeger  
☐ LTJA Long-tailed Jaeger  
☐ BOGU Bonaparte's Gull  
☐ MEGU Mew Gull  
☐ HERG Herring Gull  
☒ GWGU Glaucous-winged Gull  
☐ GLGU Glaucous Gull  
☐ BLKI Black-legged Kittiwake  
☐ ARTE Arctic Tern  
☐ ALTE Aleutian Tern  
☐ COMU Common Murre  
☐ PIGU Pigeon Guillemot  
☐ MAMU Marbled Murrelet  
☐ TUPU Tufted Puffin  
☐ HOPU Horned Puffin  
☐ RODO Rock Dove  
☐ GHOW Great Horned Owl  
☐ NHOW Northern Hawk Owl  
☐ BDOW Barred Owl  
☐ GGOW Great Gray Owl  
☐ SEOW Short-eared Owl  
☐ BLSW Black Swift  
☐ VASW Vaux's Swift  
☐ RUHU Rufous Hummingbird  
☐ BEKI Belted Kingfisher  
☐ RBSA Red-breasted Sapsucker  
☐ DOWO Downy Woodpecker  
☐ HAWO Hairy Woodpecker  
☐ TTWO Three-toed Woodpecker  
☐ BBWO Black-backed Woodpecker  
☐ NOFL Northern Flicker  
☐ YSFL Yellow-shafted Flicker  
☐ RSFL Red-shafted Flicker  
☐ OSFL Olive-sided Flycatcher  
☐ WEWP Western Wood-Pewee  
☒ ALFL Alder Flycatcher  
☐ HAFL Hammond's Flycatcher  
☐ PSFL Pacific-slope Flycatcher  
☐ SAPH Say's Phoebe  
☐ HOLA Horned Lark  
☐ TRES Tree Swallow  
☒ VGSW Violet-green Swallow  
☐ NRWS N. Rough-winged Swallow  
☐ BANS Bank Swallow  
☐ CLSW Cliff Swallow  
☐ BARS Barn Swallow  
☐ GRAJ Gray Jay  
☐ STJA Steller's Jay  
☐ BBMA Black-billed Magpie  
☐ AMCR American Crow  
☐ NOCR Northwestern Crow  
☐ CORA Common Raven  
☒ BCCH Black-capped Chickadee  
☒ BOCH Boreal Chickadee  
☒ CBCH Chestnut-backed Chickadee  
☐ RBNU Red-breasted Nuthatch  
☒ BRGR Brown Creeper  
☐ WIWR Winter Wren  
☒ AMDI American Dipper  
☐ ARWA Arctic Warbler  
☐ GCKI Golden-crowned Kinglet

☒ RCKI Ruby-crowned Kinglet  
☐ BLUE Bluethroat  
☐ NOWH Northern Wheatear  
☐ TOSO Townsend's Solitaire  
☐ GCTH Gray-cheeked Thrush  
☒ SWTH Swainson's Thrush  
☒ HETH Hermit Thrush  
☒ AMRO American Robin  
☒ VATH Varied Thrush  
☐ YWAG Yellow Wagtail  
☐ WHWA White Wagtail  
☐ AMPI American Pipit  
☐ BOWA Bohemian Waxwing  
☐ CEDW Cedar Waxwing  
☐ NSHR Northern Shrike  
☐ WAVI Warbling Vireo  
☐ REVI Red-eyed Vireo  
☒ OCWA Orange-crowned Warbler  
☒ YWAR Yellow Warbler  
☒ MYWA Myrtle Warbler  
☐ AUWA Audubon's Warbler  
☐ YRWA Yellow-rumped Warbler  
☐ TOWA Townsend's Warbler  
☐ BLPW Blackpoll Warbler  
☐ AMRE American Redstart  
☒ NOWA Northern Waterthrush  
☐ MGWA MacGillivray's Warbler  
☐ COYE Common Yellowthroat  
☒ WIWA Wilson's Warbler  
☐ ATSP American Tree Sparrow  
☐ CHSP Chipping Sparrow  
☐ SAVS Savannah Sparrow  
☒ FOSP Fox Sparrow  
☐ SOSP Song Sparrow  
☐ LISP Lincoln's Sparrow  
☒ GCSP Golden-crowned Sparrow  
☐ WCSP White-crowned Sparrow  
☒ SCJU Slate-colored Junco  
☐ ORJU Oregon Junco  
☐ DEJU Dark-eyed Junco  
☐ LALO Lapland Longspur  
☐ SNBU Snow Bunting  
☒ RUBL Rusty Blackbird  
☐ GCRF Gray-crowned Rosy-Finch  
☐ PIGR Pine Grosbeak  
☐ RECR Red Crossbill  
☒ WWCR White-winged Crossbill  
☒ CORE Common Redpoll  
☒ HORE Hoary Redpoll  
☒ PISI Pine Siskin

☐ Shrew (sp.)  
☐ Bat (sp.)  
☐ Arctic fox  
☐ Coyote  
☐ Wolf  
☐ Red fox  
☐ Lynx  
☐ River otter  
☐ Wolverine  
☐ Marten  
☐ Fisher  
☐ Ermine  
☐ Least weasel  
☐ Mink  
☐ Black bear  
☐ Brown bear  
☒ Moose  
☐ Mule deer  
☐ Caribou  
☐ Bison  
☐ Mountain goat  
☐ Muskox  
☐ Dall's sheep  
☐ Alaska marmot  
☐ Hoary marmot  
☐ Woodchuck  
☐ Arctic ground squirrel  
☒ Red squirrel  
☐ Northern flying squirrel  
☒ Beaver  
☐ Jumping mouse (sp.)  
☐ Red-backed vole (sp.)  
☐ Collared lemming  
☐ Brown lemming  
☐ Microtus vole (sp.)  
☐ Muskrat  
☐ Northern bog lemming  
☐ Deer mouse (sp.)  
☐ Porcupine  
☐ Collared pika  
☐ Snowshoe hare  
☐ Tundra hare

### MAMMAL EVIDENCE

Visual observation  
 Tracks  
 Sign  
 Dam

### BREEDING BIRD EVIDENCE

**X** Detected, no evidence of breeding  
**H** Observed in possible nesting habitat  
**P** Pair observed in suitable habitat  
**S** Singing male  
**C** Courtship display

**B** Building or excavating nest  
**A** Alarm call  
**D** Distraction display, injury-feigning  
**N** Nest observed  
**Y** Downy or recently fledged young  
**F** Adult with fecal sac or food for young



**ALMS****HABITAT BLOCK DATA**Land unit: GRANT LAKE  
Dates: 16 & 17 JUNE 2013Block #:                       
Block name: GRANT LAKE  
Topo map quad:                     **PHOTOS**

- ☒ Digital → Interfaced with GPS?  
☐ Slide film ☐ Yes  
☐ Print film ☒ No

**OBSERVER INFORMATION**Name: AMAL R ASMI  
First name Middle initial Last nameAffiliation: ERM ALASKA, INC.Address: 748 GANNETT ROAD, SUITE 102City: FAIRBANKS State: AK Zip: 99701Tel: 907-458-8273 email: AMAL.ASMI@ERM.COMAdditional observers: ROBERT J. BECKMAN**CONTACT INFORMATION***(If different)*Name:                       
First name Middle initial Last nameAffiliation:                     Address:                     City:                      State:            Zip:           Tel:                      email:                     **EXOTIC PLANTS**

Mark each EXOTIC PLANT SPECIES detected anywhere within the grid of points.

- ☒ Did not look for exotics  
☐ Bird Vetch (*Vicia cracca*)  
☐ Canada Thistle (*Cirsium arvense*)  
☐ White Sweetclover (*Melilotus albus*)  
☐ Other:                       
☐ Other:

**MISCELLANEOUS FIELD NOTES**

Point

Notes

ALL WENT WELL EXCEPT PNT #7 -  
WE HAD TO MOVE IT BECAUSE CREEK  
HAD INUNDATED PNT.

15 JUNE: ORDER FOR DAY: GL#13; #14; GL#12  
GL#11; GL#10; GL#8; GL#6; GL#9; GL#7

16 JUNE: ORDER FOR DAY: GL#1; GL#2; GL#3;  
GL#4; GL#5



Land unit: GRANT LAKE  
 Block #: 1/2 IS GRANT LK.

 Date: 15 JUNE 2013  
 Observers: APA; PSB

 Point #: GL#13  
 Habitat # 1 of 2  
 % of circle: 100% GRANT LAKE 50%

## CLASSIFICATION

- ☒ 1. Water body with no floating or emergent vegetation.  
 NWI: \_\_\_\_\_ Kessel: 1A Viereck: NA GRANT LAKE
- ☐ 2. Water body with > 2% vegetation cover.  
 NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 3. Vegetated wetland without open water body.  
 NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
 NWI: NA Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 5. Non-wetland with > 2% vegetation cover.  
 NWI: NA Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS  
CODES for  
LARGEST TREES,  
SHRUBS,  
NON-WOODY  
PLANTS, &  
GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %

## VEGETATION

 SINGLE-STEMMED TREES > 3 m  
 % TREE canopy cover: 50 % coniferous: 5 % OF ALL TREES

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>ALNCR1</u>	<u>50</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>	<u>4</u>
2. <u>PCGLA</u>	<u>10</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>3</u>
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

 SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m  
 Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>ALNCR1</u>	<u>1%</u>	<u>10</u>	<u>1</u>
2. <u>PCGLA</u>	<u>1%</u>	<u>10</u>	<u>1</u>

 SHRUBS (Multiple-stemmed, woody plants)  
 Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>10</u>	<u>4</u>	<u>ROSACE</u>
2.	<u>0.5</u>	<u>4</u>	<u>VACU</u>
3.	<u>0.2</u>	<u>4</u>	<u>RIBTRI</u>
4.	<u>0.3</u>	<u>4</u>	<u>VACULT</u>

NON-WOODY  
PLANTS

Cover class	Species (list by dominance)
<u>4</u>	<u>GRASS</u>
<u>4</u>	<u>ESKIMO POTATO; VIOLET;</u>
<u>4</u>	<u>OAK FERN</u>
<u>3</u>	

## GROUND COVER

Mosses/hepatics	<u>5</u>	<u>MOSS</u>
Lichens	<u>3</u>	<u>PROG. Pelt</u>
Litter	<u>5</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>3</u>	
Ephemeral snow	<u>0</u>	



Land unit: GRANT LAKEBlock #: GL #13Date: 15 JUL 2013Point #: GL #13Observers: APA / RSB

## TOPOGRAPHY

Elevation (m) 1115 Aspect 0° Slope 0°

## TOPOGRAPHIC POSITION

- ☐ Summit ☐ Highslope ☒ Basin  
☐ Ridge ☐ Midslope ☐ Valley  
☐ Lowslope ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face ☐ Step in slope ☐ Alluvia/moraine  
☐ Cut-bank ☐ Floodplain ☐ Dunes  
☒ Other GRANT LAKE

## PHOTO

Roll/frame or  
Digital ID #Facing North: ☒Facing South: ☒Facing East: ☒Facing West: ☒

## DISTURBANCE

☐ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	<u>&gt;1</u>	<u>1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	<u>&gt;1</u>	<u>1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other human disturbances	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

- No. coniferous snags: ☐ 1 ☐ 2 ☒ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☐ 1 ☐ 2 ☒ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☐ < 1 ☒ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? ☒ YES ☐ NO

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☒ Lake/Pond

Shore type and vegetation:

- ☒ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

B. Is the water body at least 10 m wide? ☒ YES ☐ NO

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☐ YES ☒ NO

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). ☐ YES ☒ NO

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ YES ☐ NO



Land unit: GRANT LAKE  
Block #:                     Date: 17 JUNE 2013  
Observers: APA, RJBPoint #: GL#13  
Habitat # 2 of 2  
% of circle: 40%

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW:        Kessel:        Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW:        Kessel:        Viereck:
- ☒ 3. Vegetated wetland without open water body.  
NW:        Kessel: IVg Viereck:
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel:        Viereck: NA
- ☐ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel:        Viereck:

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 15 % coniferous: 5

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees	
		3-5	5-9	9-21	> 21	DBH class	Cover class
1. <u>PCGLA</u>	<u>5</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. <u>ALNCR1</u>	<u>10</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>10</u>	<u>4</u>	<u>VIBESU</u>
2.	<u>10</u>	<u>4</u>	<u>ROSACE</u>
3.	<u>10</u>	<u>4</u>	<u>SALSPA</u>
4.	<u>10</u>	<u>4</u>	<u>VACULI</u>

## NON-WOODY PLANTS

Cover class Species (list by dominance)

Graminoids	<u>7</u>	<u>GRASS</u>
Herbs	<u>3</u>	<u>VIOPAL; POTPAL;</u>
Ferns	<u>4</u>	<u>DAK</u>
Horsetails	<u>2</u>	

## GROUND COVER

Mosses/hepatics	<u>0</u>	
Lichens	<u>0</u>	
Litter	<u>7</u>	<u>LEAVES</u>
Bare ground	<u>0</u>	
Ephemeral snow	<u>0</u>	

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

## COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, &amp; GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKE  
Date: 17 JUNE 2013  
Observers: ARA, RJBBlock #: GL413  
Point #: GL413**TOPOGRAPHY**Elevation (m) 1115 Aspect 0° Slope 10°**TOPOGRAPHIC POSITION**

- |                                 |                                    |   |
|---------------------------------|------------------------------------|---|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope | <input checked="" type="checkbox"/> Basin |
| <input type="checkbox"/> Ridge  | <input type="checkbox"/> Midslope  | <input type="checkbox"/> Valley           |
|                                 | <input type="checkbox"/> Lowslope  | <input type="checkbox"/> Plain            |

**LOCAL FEATURES**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cliff/rock face | <input type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input type="checkbox"/> Floodplain    | <input type="checkbox"/> Dunes           |

☒ Other GRANT LAKE - WIDE STREAM INLET TO.**PHOTO**Roll/frame or  
Digital ID #Facing North: ✓Facing South: ✓Facing East: ✓Facing West: ✓**DISTURBANCE**☒ None

Type	% of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

**DISTURBANCE SEVERITY CODES**

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

**COARSE WOODY DEBRIS** (Within 50-m radius circle)

- |                       |                                       |                              |   |                               |                                |                                |                                  |
|-----------------------|---------------------------------------|------------------------------|---|-------------------------------|--------------------------------|--------------------------------|----------------------------------|
| No. coniferous snags: | <input type="checkbox"/> 1            | <input type="checkbox"/> 2   | <input checked="" type="checkbox"/> 3-4 | <input type="checkbox"/> 5-6  | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| No. deciduous snags:  | <input checked="" type="checkbox"/> 1 | <input type="checkbox"/> 2   | <input type="checkbox"/> 3-4            | <input type="checkbox"/> 5-6  | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| % cover downed logs:  | <input type="checkbox"/> << 1         | <input type="checkbox"/> < 1 | <input checked="" type="checkbox"/> 1-5 | <input type="checkbox"/> 6-25 | <input type="checkbox"/> 26-50 | <input type="checkbox"/> 51-75 | <input type="checkbox"/> 76-100% |

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES ☒ NO ☐

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

☐ Marine☐ Estuarine☐ River/Stream☒ Lake/Pond

Shore type and vegetation:

☒ Bedrock, boulders, large stones☐ Organic material, mud, sand, gravel, cobbles☐ < 30% vegetated☐ > 30% vegetatedB. Is the water body at least 10 m wide? YES ☒ NO ☐

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☒ NO ☐

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☐ NO ☒



Land unit: GRANT LAKE  
Block #:                     Date: 15 JUNE 2013  
Observers: APA, RJBPoint #: GL#14  
Habitat # 1 of 1  
% of circle: 100

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NW:        Kessel:        Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NW:        Kessel:        Viereck:       

- ☐
3. Vegetated wetland without open water body.

NW:        Kessel:        Viereck:       

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNW: NA Kessel:        Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NW: NA Kessel: VLb Viereck:       

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS  
CODES for  
LARGEST TREES,  
SHRUBS,  
NON-WOODY  
PLANTS, &  
GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 85 % coniferous: 100

TREE LAYER species	% cover	Avg. ht. (m)				DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>TSUMER</u>	<u>60</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>6</u>
2. <u>PICGLA</u>	<u>40</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>5</u>
3. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>TSUMER</u>	<u>20</u>	<u>0.5</u>	<u>N/A</u>
2. <u>PICGLA</u>	<u>20</u>	<u>1.0</u>	<u>N/A</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1. <u>0.8</u>	<u>4</u>	<u>4</u>	<u>BETULAX</u>
2. <u>0.5</u>	<u>4</u>	<u>4</u>	<u>LEDDEC</u>
3. <u>0.2</u>	<u>6</u>	<u>6</u>	<u>CROWBERRY (EMPNIQ)</u>
4. <u>0.5</u>	<u>4</u>	<u>4</u>	<u>VACUWI</u>

NON-WOODY  
PLANTS

Cover class Species (list by dominance)

Graminoids	<u>7</u>	<u>GRASS</u>
Herbs	<u>0</u>	<u>      </u>
Ferns	<u>0</u>	<u>      </u>
Horsetails	<u>0</u>	<u>      </u>

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>6</u>	<u>      </u>
Litter	<u>1</u>	<u>LEAVES</u>
Bare ground	<u>0</u>	<u>      </u>
Ephemeral snow	<u>0</u>	<u>      </u>



Land unit: GRANT LAKE  
 Date: 15 JUNE 2013  
 Observers: ARA, RJB

 Block #: X  
 Point #: GL#14

## TOPOGRAPHY

 Elevation (m) 1115 Aspect 0° Slope 0°

## TOPOGRAPHIC POSITION

- ☐ Summit ☐ Highslope ☒ Basin  
☐ Ridge ☐ Midslope ☐ Valley  
☐ Lowslope ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face ☐ Step in slope ☐ Alluvia/moraine  
☐ Cut-bank ☐ Floodplain ☐ Dunes  
☒ Other GRANT CREEK MOUTH

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North: ✓ Facing South: ✓  
 Facing East: ✓ Facing West: ✓

## DISTURBANCE

☒ None

 % of  
circle

 Severity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other human disturbances	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags: ☐ 1 ☒ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☐ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☒ < 1 ☐ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

 1. Is there a water body at least partly inside the 50-m radius circle? YES ☒ NO ☐

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☒ River/Stream  
☒ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

 B. Is the water body at least 10 m wide? YES ☒ NO ☐

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be &gt; 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

 2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

 3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

 For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #: XXXXDate: 15 JUNE 2013  
Observers: APR RJBPoint #: GL#12  
Habitat #: 1 of 1  
% of circle: 100

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 3. Vegetated wetland without open water body.  
NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NWI: NA Kessel: \_\_\_\_\_ Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NWI: NA Kessel: VEB Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 87 % coniferous: 99

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>TSUMR</u>	<u>90</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>7</u>
2. <u>PICGLA</u>	<u>10</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>4</u>
3. <u>ALNCRI</u>	<u>&gt;10</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>	<u>1</u>
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht.(m) Avg. DBH class

1. <u>TSUMR</u>	<u>3</u>	<u>10</u>	<u>N/A</u>
2. <u>PICGLA</u>	<u>2</u>	<u>15</u>	<u>N/A</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer	Avg. ht.(m)	Cover class	Species (list for each layer)
1.	<u>10</u>	<u>4</u>	<u>NENTFR</u> - "FOOLS HUCKBERRY"
2.	<u>01</u>	<u>1</u>	<u>CORCAN</u>
3.	<u>01</u>	<u>1</u>	<u>VACUT</u>
4.	<u>01</u>	<u>1</u>	<u>EMPNUG</u>

NON-WOODY  
PLANTS

	Cover class	Species (list by dominance)
Graminoids	<u>0</u>	<u>GRASS</u>
Herbs	<u>0</u>	
Ferns	<u>0</u>	
Horsetails	<u>3</u>	

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>4</u>	<u>FRAG FELT</u>
Litter	<u>2</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	
Ephemeral snow	<u>0</u>	



Land unit: GRANT LAKEBlock #:           Date: 15 JUNE 2013Point #: GL#12Observers: APA RJB

## TOPOGRAPHY

Elevation (m) 1118 Aspect NW° Slope 3°

## TOPOGRAPHIC POSITION

- ☐ Summit      ☐ Highslope      ☐ Basin  
☐ Ridge      ☒ Midslope      ☐ Valley  
☐ Lowslope      ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face      ☒ Step in slope      ☐ Alluvia/moraine  
☐ Cut-bank      ☐ Floodplain      ☐ Dunes  
☐ Other

## PHOTO

Roll/frame or  
Digital ID #
 Facing North:            Facing South:             
 Facing East:            Facing West:           

## DISTURBANCE

☒ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other <u>                                </u>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags: ☐ 1 ☐ 2 ☐ 3-4 ☒ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☒ < 1 ☐ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES NO  
☐ ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

B. Is the water body at least 10 m wide? ☐ ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☐ ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). ☐ ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ ☐



Land unit: GRANT LAKE  
Block #: XDate: 15 JUNE 2013  
Observers: APA, PJBPoint #: GL#11  
Habitat # 1 of 1  
% of circle: 100

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☐
3. Vegetated wetland without open water body.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNWI: NA Kessel: \_\_\_\_\_ Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NWI: NA Kessel: 11b Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 92 % coniferous: 99

TREE LAYER species	% cover	Avg. ht. (m)				DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>TSUMER</u>	<u>92</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>7</u>
2. <u>PCGLA</u>	<u>3</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>3</u>
3. <u>BETRAD</u>	<u>21</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>1</u>
4. <u>ALWCKI</u>	<u>3</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>	<u>3</u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>TSUMER</u>	<u>20</u>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
2. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<input type="checkbox"/>	<u>4</u>	<u>NEVEAR</u>
2.	<input type="checkbox"/>	<u>3</u>	<u>OPLHOR</u>
3.	<input type="checkbox"/>	<u>3</u>	<u>VACULI</u>
4.	<input type="checkbox"/>	<u>3</u>	<u>RIBARC</u>

NON-WOODY  
PLANTS

Cover class Species (list by dominance)

Graminoids	<u>0</u>	_____
Herbs	<u>2</u>	<u>GEDLIV</u>
Ferns	<u>2</u>	<u>DAKTERA</u>
Horsetails	<u>2</u>	_____

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>3</u>	<u>PELBRI</u>
Litter	<u>3</u>	<u>LEAVES ; STICKS.</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____



Land unit: SPRINT LAKE  
 Date: 15 JUNE 2013  
 Observers: ADA; RJB
Block #: ~~XXXX~~Point #: GL# 11

## TOPOGRAPHY

 Elevation (m) 1110 Aspect W° Slope 3°

## TOPOGRAPHIC POSITION

- |                                 |  |                                 |
|---------------------------------|--|---------------------------------|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope           | <input type="checkbox"/> Basin  |
| <input type="checkbox"/> Ridge  | <input checked="" type="checkbox"/> Midslope | <input type="checkbox"/> Valley |
|                                 | <input type="checkbox"/> Lowslope            | <input type="checkbox"/> Plain  |

## LOCAL FEATURES

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Cliff/rock face | <input checked="" type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input type="checkbox"/> Floodplain               | <input type="checkbox"/> Dunes           |
| <input type="checkbox"/> Other _____     |   |  |

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North: \_\_\_\_\_ Facing South: \_\_\_\_\_  
 Facing East: \_\_\_\_\_ Facing West: \_\_\_\_\_

## DISTURBANCE

☒ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2

&gt; 2

# if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

- |                       |                                       |                              |   |   |                                |                                |                                  |
|-----------------------|---------------------------------------|------------------------------|---|---|--------------------------------|--------------------------------|----------------------------------|
| No. coniferous snags: | <input type="checkbox"/> 1            | <input type="checkbox"/> 2   | <input type="checkbox"/> 3-4            | <input checked="" type="checkbox"/> 5-6 | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| No. deciduous snags:  | <input checked="" type="checkbox"/> 1 | <input type="checkbox"/> 2   | <input type="checkbox"/> 3-4            | <input type="checkbox"/> 5-6            | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| % cover downed logs:  | <input type="checkbox"/> << 1         | <input type="checkbox"/> < 1 | <input checked="" type="checkbox"/> 1-5 | <input type="checkbox"/> 6-25           | <input type="checkbox"/> 26-50 | <input type="checkbox"/> 51-75 | <input type="checkbox"/> 76-100% |

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES ☐ NO ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐
- Marine
- 
- ☐
- Estuarine
- 
- ☐
- River/Stream
- 
- ☐
- Lake/Pond

Shore type and vegetation:

- ☐
- Bedrock, boulders, large stones
- 
- ☐
- Organic material, mud, sand, gravel, cobbles
- 
- ☐
- < 30% vegetated
- 
- ☐
- > 30% vegetated

B. Is the water body at least 10 m wide? YES ☐ NO ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #: XDate: 15 JUNE 2013  
Observers: APAS, RJBPoint #: GL#10  
Habitat # 1 of 1  
% of circle: 100

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☐
3. Vegetated wetland without open water body.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNWI: NA Kessel: \_\_\_\_\_ Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NWI: NA Kessel: DB Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS  
CODES for  
LARGEST TREES,  
SHRUBS,  
NON-WOODY  
PLANTS, &  
GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 92 % coniferous: 99

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees	
		3-5	5-9	9-21	> 21	DBH class	Cover class
1. <u>TSUMER</u>	<u>99</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>2</u>
2. <u>PICGIA</u>	<u>1</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>3</u>
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>TSUMER</u>	<u>20</u>	<u>1.0</u>	<u>N/A</u>
2. _____	_____	<u>  </u>	_____

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>1.0</u>	<u>4</u>	<u>NEBNER</u>
2.	<u>0.4</u>	<u>4</u>	<u>VACULI</u>
3.	<u>0.2</u>	<u>2</u>	<u>VACVIT</u>
4.	<u>0.1</u>	<u>2</u>	<u>EMPNIG</u>

NON-WOODY  
PLANTS

Cover class Species (list by dominance)

Graminoids	<u>0</u>	_____
Herbs	<u>2</u>	<u>GETLIV</u>
Ferns	<u>2</u>	<u>ORKEPN</u>
Horsetails	<u>0</u>	_____

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>2</u>	<u>PELBRI</u>
Litter	<u>2</u>	<u>STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____



Land unit: SPENT LAKE  
 Date: 15 JUL 2013  
 Observers: APA; RB
Block #:           Point #: GL# 10

## TOPOGRAPHY

 Elevation (m) 1112 Aspect NW° Slope 3°

## TOPOGRAPHIC POSITION

- |                                 |  |                                 |
|---------------------------------|--|---------------------------------|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope           | <input type="checkbox"/> Basin  |
| <input type="checkbox"/> Ridge  | <input checked="" type="checkbox"/> Midslope | <input type="checkbox"/> Valley |
|                                 | <input type="checkbox"/> Lowslope            | <input type="checkbox"/> Plain  |

## LOCAL FEATURES

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Cliff/rock face | <input checked="" type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input type="checkbox"/> Floodplain               | <input type="checkbox"/> Dunes           |
| <input type="checkbox"/> Other           |   |  |

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North: ✓ Facing South: ✓  
 Facing East: ✓ Facing West: ✓

## DISTURBANCE

☒ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage			<input type="checkbox"/>	<input type="checkbox"/>	
Disease			<input type="checkbox"/>	<input type="checkbox"/>	
Beaver ponds			<input type="checkbox"/>	<input type="checkbox"/>	
Beaver cuttings			<input type="checkbox"/>	<input type="checkbox"/>	
Other animal activity			<input type="checkbox"/>	<input type="checkbox"/>	
Fire			<input type="checkbox"/>	<input type="checkbox"/>	
Flooding			<input type="checkbox"/>	<input type="checkbox"/>	
Wind			<input type="checkbox"/>	<input type="checkbox"/>	
Landslide/avalanche			<input type="checkbox"/>	<input type="checkbox"/>	
Logging			<input type="checkbox"/>	<input type="checkbox"/>	
Roads			<input type="checkbox"/>	<input type="checkbox"/>	
Other human disturbances			<input type="checkbox"/>	<input type="checkbox"/>	
Other			<input type="checkbox"/>	<input type="checkbox"/>	

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags:	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input checked="" type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input type="checkbox"/> >12
No. deciduous snags:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input type="checkbox"/> >12
% cover downed logs:	<input type="checkbox"/> << 1	<input type="checkbox"/> < 1	<input checked="" type="checkbox"/> 1-5	<input type="checkbox"/> 6-25	<input type="checkbox"/> 26-50	<input type="checkbox"/> 51-75	<input type="checkbox"/> 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES ☐ NO ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐
- Marine
- 
- ☐
- Estuarine
- 
- ☐
- River/Stream
- 
- ☐
- Lake/Pond

Shore type and vegetation:

- ☐
- Bedrock, boulders, large stones
- 
- ☐
- Organic material, mud, sand, gravel, cobbles
- 
- ☐
- < 30% vegetated
- 
- ☐
- > 30% vegetated

B. Is the water body at least 10 m wide? YES ☐ NO ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #: XDate: 15 JUNE 2013  
Observers: RAJ, RJBPoint #: GL#8  
Habitat # 1 of 2  
% of circle: 55%

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 3. Vegetated wetland without open water body.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock    ☐ Bare soil    ☐ Persistent snow or ice  
☐ Rocks, stones, gravel    ☐ Sand  
 NW: NA    Kessel: \_\_\_\_\_    Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NW: NA    Kessel: IIb    Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 90 % coniferous: 90

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees	
		3-5	5-9	9-21	> 21	DBH class	Cover class
1. <u>TSUMER</u>	<u>48</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
2. <u>PICMAR</u>	<u>48</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
3. <u>BETPAP</u>	<u>4</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>3</u>
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>TSUMER</u>	<u>10</u>	<u>10</u>	<u>NIA</u>
2. <u>PICMAR</u>	<u>5</u>	<u>10</u>	<u>NIA</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>10</u>	<u>4</u>	<u>MENFER</u>
2.	<u>20</u>	<u>4</u>	<u>SALSPA.</u>
3.	<u>10</u>	<u>4</u>	<u>RIBTRI</u>
4.	<u>10</u>	<u>3</u>	<u>OPLHOR</u>

NON-WOODY  
PLANTS

	Cover class	Species (list by dominance)
Graminoids	<u>3</u>	<u>GRASS</u>
Herbs	<u>2</u>	<u>EPIANG. STRAMP</u>
Ferns	<u>5</u>	<u>OAK &amp; WOOD FERN</u>
Horsetails	<u>0</u>	_____

## GROUND COVER

Mosses/hepatics	<u>5</u>	<u>MOSS</u>
Lichens	<u>2</u>	<u>CLADOR</u>
Litter	<u>4</u>	<u>LEAVES</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____



Land unit: GRANT LAKEBlock #: XXXXDate: 15 JUNE 2013Point #: GL#8Observers: APA, RB

## TOPOGRAPHY

Elevation (m) 1110 Aspect NW° Slope 40°

## TOPOGRAPHIC POSITION

- ☐ Summit ☐ Highslope ☐ Basin  
☐ Ridge ☒ Midslope ☐ Valley  
☐ Lowslope ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face ☒ Step in slope ☐ Alluvia/moraine  
☐ Cut-bank ☐ Floodplain ☐ Dunes  
☐ Other \_\_\_\_\_

## PHOTO

Roll/frame or  
Digital ID #
 Facing North: ✓ Facing South: ✓  
 Facing East: ✓ Facing West: ✓

## DISTURBANCE

Type	<input checked="" type="checkbox"/> None	Severity code	Yrs since disturbance		
	% of circle		< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

- No. coniferous snags: ☐ 1 ☐ 2 ☐ 3-4 ☒ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☐ 1 ☐ 2 ☐ 3-4 ☒ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☐ < 1 ☐ 1-5 ☒ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES ☐ NO ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

B. Is the water body at least 10 m wide? ☐ ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☐ ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). ☐ ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ ☐



**ALMS****HABITAT DESCRIPTION**Land unit: GRANT LAKE  
Block #: XDate: 15 JUNE 2013  
Observers: RA, RBPoint #: GL#8  
Habitat # 2 of 2  
% of circle: 45**CLASSIFICATION**

- ☐
1. Water body with no floating or emergent vegetation.

NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☒
3. Vegetated wetland without open water body.

NW: \_\_\_\_\_ Kessel: IV 9 Viereck: \_\_\_\_\_

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNW: NA Kessel: \_\_\_\_\_ Viereck: NA

- ☐
5. Non-wetland with > 2% vegetation cover.

NW: NA Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_**VEGETATION****SINGLE-STEMMED TREES > 3 m**% TREE canopy cover: 65 % coniferous: 70

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PCMAR</u>	<u>75</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>6</u>
2. <u>BET PAP</u>	<u>25</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>4</u>
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

**SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m**

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>PCMAR</u>	<u>30</u>	<u>20</u>	<u>N/A</u>
2. <u>ALNCRI</u>	<u>1</u>	<u>15</u>	<u>N/A</u>

**SHRUBS (Multiple-stemmed, woody plants)**

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>10</u>	<u>4</u>	<u>MENFER</u>
2.	<u>10</u>	<u>3</u>	<u>RIBTRI</u>
3.	<u>11</u>	<u>3</u>	<u>RUBARC</u>
4.	<u>15</u>	<u>3</u>	<u>VACULI</u>

**NON-WOODY PLANTS**

Cover class Species (list by dominance)

Graminoids	<u>4</u>	<u>GRASS</u>
Herbs	<u>2</u>	<u>EP LANG</u>
Ferns	<u>4</u>	<u>OAK FERN</u>
Horsetails	<u>0</u>	_____

**GROUND COVER**

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>0</u>	_____
Litter	<u>3</u>	<u>LEAVES STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

**COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER**

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %







**ALMS**

**HABITAT DESCRIPTION**

Land unit: GRANT LAKE  
Block #: X

Date: 15 JUNE 2013  
Observers: APA, RIB

Point #: GL#6  
Habitat #: 1 of 2  
% of circle: 60

**CLASSIFICATION**

- ☐ 1. Water body with no floating or emergent vegetation.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☒ 3. Vegetated wetland without open water body.  
NW: \_\_\_\_\_ Kessel: ILA Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

**VEGETATION**

**SINGLE-STEMMED TREES > 3 m**

% TREE canopy cover: 100 % coniferous: 100

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PICMAR</u>	<u>100</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>7</u>
2. <u>BETGLA</u>	<u>&gt;1</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>2</u>
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

**SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m**

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>PICMAR</u>	<u>25</u>	<u>1.0</u>	<u>N/A</u>
2. _____	_____	<u>  </u>	_____

**SHRUBS (Multiple-stemmed, woody plants)**

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>0.7</u>	<u>6</u>	<u>SALPA.</u>
2.	<u>0.5</u>	<u>4</u>	<u>BETGLA</u>
3.	<u>0.4</u>	<u>4</u>	<u>LEDDEC</u>
4.	<u>0.6</u>	<u>4</u>	<u>VACULI</u>

**NON-WOODY PLANTS**

	Cover class	Species (list by dominance)
Graminoids	<u>5</u>	<u>GRASS</u>
Herbs	<u>0</u>	_____
Ferns	<u>0</u>	_____
Horsetails	<u>3</u>	_____

**GROUND COVER**

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>0</u>	_____
Litter	<u>4</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

**COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER**

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKEBlock #: GL#6Date: 15 JUNE 2013Point #: GL#6Observers: ARA; RJB**TOPOGRAPHY**Elevation (m) 1145 Aspect 0° Slope 0°**TOPOGRAPHIC POSITION**

- |                                 |                                    |   |
|---------------------------------|------------------------------------|---|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope | <input checked="" type="checkbox"/> Basin |
| <input type="checkbox"/> Ridge  | <input type="checkbox"/> Midslope  | <input type="checkbox"/> Valley           |
|                                 | <input type="checkbox"/> Lowslope  | <input type="checkbox"/> Plain            |

**LOCAL FEATURES**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cliff/rock face | <input type="checkbox"/> Step in slope         | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input checked="" type="checkbox"/> Floodplain | <input type="checkbox"/> Dunes           |
| <input type="checkbox"/> Other           |  |  |

**PHOTO**Roll/frame or  
Digital ID #Facing North: ☒ Facing South: ☒  
Facing East: ☒ Facing West: ☒**DISTURBANCE**

Type	<input checked="" type="checkbox"/> None	Severity code	Yrs since disturbance		
	% of circle		< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

**DISTURBANCE SEVERITY CODES**

- 1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.
- 2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

**COARSE WOODY DEBRIS** (Within 50-m radius circle)

- No. coniferous snags: ☐ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☒ 10-12 ☐ >12
- No. deciduous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12
- % cover downed logs: ☐ << 1 ☐ < 1 ☒ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES
- ☐
- NO
- ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐
- Marine
- 
- ☐
- Estuarine
- 
- ☐
- River/Stream
- 
- ☐
- Lake/Pond

Shore type and vegetation:

- ☐
- Bedrock, boulders, large stones
- 
- ☐
- Organic material, mud, sand, gravel, cobbles
- 
- ☐
- < 30% vegetated
- 
- ☐
- > 30% vegetated

- B. Is the water body at least 10 m wide?
- ☐
- YES
- ☒
- NO

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☒ YES ☐ NO

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). ☐ YES ☒ NO

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions). For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☐ YES ☒ NO



Land unit: GRANT LAKE  
Block #:                     Date: 15 JUNE 2013  
Observers: RAJ, RJBPoint #: GL#6  
Habitat # 2 of 2  
% of circle: 40

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NW:        Kessel:        Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NW:        Kessel:        Viereck:       

- ☐
3. Vegetated wetland without open water body.

NW:        Kessel:        Viereck:       

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNW: NA Kessel:        Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NW: NA Kessel: ILC Viereck:       

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS  
CODES for  
LARGEST TREES,  
SHRUBS,  
NON-WOODY  
PLANTS, &  
GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 95 % coniferous: 30

TREE LAYER species	% cover	Avg. ht. (m)				DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>BETPAP</u>	<u>70</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>6</u>
2. <u>PCMAR</u>	<u>30</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
3. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>PCMAR</u>	<u>5</u>	<u>20</u>	<u>2</u>
2. <u>BETPAP</u>	<u>3</u>	<u>10</u>	<u>N/A</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>15</u>	<u>5</u>	<u>MENFER</u>
2.	<u>01</u>	<u>4</u>	<u>EMPNIG</u>
3.	<u>01</u>	<u>4</u>	<u>VALVIT</u>
4.	<u>01</u>	<u>4</u>	<u>RUBCHA</u>

NON-WOODY  
PLANTS

Cover class Species (list by dominance)

Graminoids	<u>0</u>	<u>      </u>
Herbs	<u>3</u>	<u>GEDLV, EPANG</u>
Ferns	<u>0</u>	<u>      </u>
Horsetails	<u>0</u>	<u>      </u>

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>0</u>	<u>      </u>
Litter	<u>4</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	<u>      </u>
Ephemeral snow	<u>0</u>	<u>      </u>



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKEBlock #: GL#6Date: 15 JUNE 2013Point #: GL#6Observers: APA, RJB**TOPOGRAPHY**Elevation (m) 1112 Aspect NE° Slope 35°**TOPOGRAPHIC POSITION**

- |                                 |  |                                 |
|---------------------------------|--|---------------------------------|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope           | <input type="checkbox"/> Basin  |
| <input type="checkbox"/> Ridge  | <input checked="" type="checkbox"/> Midslope | <input type="checkbox"/> Valley |
|                                 | <input type="checkbox"/> Lowslope            | <input type="checkbox"/> Plain  |

**LOCAL FEATURES**

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Cliff/rock face | <input checked="" type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input type="checkbox"/> Floodplain               | <input type="checkbox"/> Dunes           |
| <input type="checkbox"/> Other _____     |   |  |

**PHOTO**Roll/frame or  
Digital ID #Facing North: ☒ Facing South: ☒  
Facing East: ☒ Facing West: ☒**DISTURBANCE**

Type	<input checked="" type="checkbox"/> None % of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

**DISTURBANCE SEVERITY CODES**

- 1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.
- 2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

**COARSE WOODY DEBRIS** (Within 50-m radius circle)

- No. coniferous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12
- No. deciduous snags: ☐ 1 ☒ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12
- % cover downed logs: ☒ << 1 ☐ < 1 ☐ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle? YES
- ☐
- NO
- ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

- B. Is the water body at least 10 m wide?
- ☐
- YES
- ☒
- NO

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☐ YES ☒ NO

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). ☐ YES ☒ NO

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ YES ☐ NO



**ALMS****HABITAT DESCRIPTION**Land unit: GRANT LAKE  
Block #:                     Date: 15 JUNE 2013  
Observers: RAJ, RJBPoint #: GL#9  
Habitat #: 1 of 1  
% of circle: 100**CLASSIFICATION**

- ☐ 1. Water body with no floating or emergent vegetation.  
NW:        Kessel:        Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW:        Kessel:        Viereck:
- ☐ 3. Vegetated wetland without open water body.  
NW:        Kessel:        Viereck:
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel:        Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel: ILC Viereck:

**VEGETATION****SINGLE-STEMMED TREES > 3 m**% TREE canopy cover: 85 % coniferous: 45

TREE LAYER species	% cover	Avg. ht. (m)				DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>BETPAP</u>	<u>55</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>6</u>
2. <u>PCGLA</u>	<u>45</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>4</u>
3. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

**SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m**

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>PCGLA</u>	<u>10</u>	<u>2.0</u>	<u>2</u>
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>

**SHRUBS (Multiple-stemmed, woody plants)**

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>1.0</u>	<u>4</u>	<u>MENFER</u>
2.	<u>0.2</u>	<u>4</u>	<u>CORCAN</u>
3.	<u>1.0</u>	<u>3</u>	<u>OPH HOR</u>
4.	<u>0.2</u>	<u>3</u>	<u>RUBARC</u>

**NON-WOODY PLANTS**

	Cover class	Species (list by dominance)
Graminoids	<u>3</u>	<u>GRASS</u>
Herbs	<u>2</u>	<u>EPILANG, PYROLA</u>
Ferns	<u>1</u>	<u>ORF FERN + WOOD FERN</u>
Horsetails	<u>0</u>	<u>      </u>

**GROUND COVER**

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>0</u>	<u>      </u>
Litter	<u>4</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	<u>      </u>
Ephemeral snow	<u>0</u>	<u>      </u>

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKE  
Date: 15 JUNE 2013  
Observers: ARA ; RJBBlock #: GL#9  
Point #: GL#9**TOPOGRAPHY**Elevation (m) 1110 Aspect NW° Slope 15°**TOPOGRAPHIC POSITION**

- |                                 |  |                                 |
|---------------------------------|--|---------------------------------|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope           | <input type="checkbox"/> Basin  |
| <input type="checkbox"/> Ridge  | <input type="checkbox"/> Midslope            | <input type="checkbox"/> Valley |
|                                 | <input checked="" type="checkbox"/> Lowslope | <input type="checkbox"/> Plain  |

**LOCAL FEATURES**

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Cliff/rock face | <input checked="" type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank        | <input type="checkbox"/> Floodplain               | <input type="checkbox"/> Dunes           |
| <input type="checkbox"/> Other _____     |   |  |

**PHOTO**Roll/frame or  
Digital ID #Facing North: ☒ Facing South: ☒  
Facing East: ☒ Facing West: ☒**DISTURBANCE**

Type	<input type="checkbox"/> None % of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	<u>1</u>	<u>1</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

**DISTURBANCE SEVERITY CODES**

- 1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.
- 2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

**COARSE WOODY DEBRIS** (Within 50-m radius circle)

- |                       |                               |   |   |                               |                                |                                |                                  |
|-----------------------|-------------------------------|---|---|-------------------------------|--------------------------------|--------------------------------|----------------------------------|
| No. coniferous snags: | <input type="checkbox"/> 1    | <input type="checkbox"/> 2              | <input checked="" type="checkbox"/> 3-4 | <input type="checkbox"/> 5-6  | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| No. deciduous snags:  | <input type="checkbox"/> 1    | <input checked="" type="checkbox"/> 2   | <input type="checkbox"/> 3-4            | <input type="checkbox"/> 5-6  | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| % cover downed logs:  | <input type="checkbox"/> << 1 | <input checked="" type="checkbox"/> < 1 | <input type="checkbox"/> 1-5            | <input type="checkbox"/> 6-25 | <input type="checkbox"/> 26-50 | <input type="checkbox"/> 51-75 | <input type="checkbox"/> 76-100% |

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle?
- YES ☐ NO ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐
- Marine
- 
- ☐
- Estuarine
- 
- ☐
- River/Stream
- 
- ☐
- Lake/Pond

Shore type and vegetation:

- ☐
- Bedrock, boulders, large stones
- 
- ☐
- Organic material, mud, sand, gravel, cobbles
- 
- ☐
- < 30% vegetated
- 
- ☐
- > 30% vegetated

- B. Is the water body at least 10 m wide?
- ☐ YES ☒ NO

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be &gt; 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists).
- ☐ YES ☒ NO

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m
- <sup>2</sup>
- in size (11-m radius).
- ☐ YES ☒ NO

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ YES ☐ NO



**ALMS**

**HABITAT DESCRIPTION**

Land unit: GRANT LAKE  
Block #:                     

Date: 15 JUNE 2013  
Observers: MA'S RJB

Point #: GL#7  
Habitat #: 1 of 1  
% of circle: 100

**CLASSIFICATION**

- ☒ 1. Water body with no floating or emergent vegetation.  
NW:          Kessel: 1b Viereck: NA GRANT CREEK.
- ☐ 2. Water body with > 2% vegetation cover.  
NW:          Kessel:          Viereck:
- ☐ 3. Vegetated wetland without open water body.  
NW:          Kessel:          Viereck:
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel:          Viereck: NA
- ☐ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel:          Viereck:

**VEGETATION**

**SINGLE-STEMMED TREES > 3 m**

% TREE canopy cover: 65 % coniferous: 20

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>BETPA</u>	<u>80</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>7</u>
2. <u>PCGLA</u>	<u>20</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>4</u>
3. <u>POPBAL</u>	<u>21</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>5</u>	<u>1</u>
4. <u>        </u>	<u>        </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>        </u>	<u>        </u>

**SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m**

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>BETPA</u>	<u>5</u>	<u>20</u>	<u>2</u>
2. <u>PCGLA</u>	<u>1</u>	<u>15</u>	<u>2</u>

**SHRUBS (Multiple-stemmed, woody plants)**

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>15</u>	<u>4</u>	<u>VIBEDU</u>
2.	<u>15</u>	<u>4</u>	<u>RUBRI</u>
3.	<u>15</u>	<u>4</u>	<u>OPLADR</u>
4.	<u>18</u>	<u>3</u>	<u>ROSACE</u>

**NON-WOODY PLANTS**

	Cover class	Species (list by dominance)
Graminoids	<u>4</u>	<u>GRASS</u>
Herbs	<u>3</u>	<u>HERNANDIA, EPIANG'S, STAMP, PIROLA</u>
Ferns	<u>4</u>	<u>ORR + WOOD FERN</u>
Horsetails	<u>3</u>	<u>GELEP</u>

**GROUND COVER**

Mosses/hepatics	<u>4</u>	<u>MOSS</u>
Lichens	<u>0</u>	<u>        </u>
Litter	<u>5</u>	<u>LEAVES / STICKS.</u>
Bare ground	<u>0</u>	<u>        </u>
Ephemeral snow	<u>0</u>	<u>        </u>

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKE  
Date: 15 JUNE 2013  
Observers: ARA; RJBBlock #:         
Point #: GL#7**TOPOGRAPHY**Elevation (m) 1117 Aspect 0° Slope 0°**TOPOGRAPHIC POSITION**

<input type="checkbox"/> Summit	<input type="checkbox"/> Highslope	<input type="checkbox"/> Basin
<input type="checkbox"/> Ridge	<input type="checkbox"/> Midslope	<input checked="" type="checkbox"/> Valley
	<input type="checkbox"/> Lowslope	<input type="checkbox"/> Plain

**LOCAL FEATURES**

<input type="checkbox"/> Cliff/rock face	<input type="checkbox"/> Step in slope	<input type="checkbox"/> Alluvia/moraine
<input type="checkbox"/> Cut-bank	<input checked="" type="checkbox"/> Floodplain	<input type="checkbox"/> Dunes
<input type="checkbox"/> Other		

**PHOTO**Roll/frame or  
Digital ID #Facing North: ✓ Facing South: ✓  
Facing East: ✓ Facing West: ✓**DISTURBANCE**☐ None

Type	% of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	<u>85</u>	<u>2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other human disturbances	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—

**DISTURBANCE SEVERITY CODES****1 MINOR:** Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.**2 SEVERE:** Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.**COARSE WOODY DEBRIS** (Within 50-m radius circle)

No. coniferous snags:	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input checked="" type="checkbox"/> >12
No. deciduous snags:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input type="checkbox"/> >12
% cover downed logs:	<input type="checkbox"/> << 1	<input type="checkbox"/> < 1	<input type="checkbox"/> 1-5	<input checked="" type="checkbox"/> 6-25	<input type="checkbox"/> 26-50	<input type="checkbox"/> 51-75	<input type="checkbox"/> 76-100%

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

**1. Is there a water body at least partly inside the 50-m radius circle?** YES ☒ NO ☐**A. If YES, indicate the water type, shore type, and shore vegetation.**

Water type:

<input type="checkbox"/> Marine
<input type="checkbox"/> Estuarine
<input checked="" type="checkbox"/> River/Stream
<input type="checkbox"/> Lake/Pond

Shore type and vegetation:

<input checked="" type="checkbox"/> Bedrock, boulders, large stones
<input type="checkbox"/> Organic material, mud, sand, gravel, cobbles
<input type="checkbox"/> < 30% vegetated
<input type="checkbox"/> > 30% vegetated

**B. Is the water body at least 10 m wide?** YES ☐ NO ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be &gt; 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

**2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle?** This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☒ NO ☐

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

**3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle?** This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

**4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).**For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☐ NO ☒



Land unit: GRANT LAKE  
Block #:                     Date: 16 JUNE 2013  
Observers: APA; ROBPoint #: 61#1  
Habitat # 1 of 1  
% of circle: 1000

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NW:        Kessel:        Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NW:        Kessel:        Viereck:       

- ☐
3. Vegetated wetland without open water body.

NW:        Kessel:        Viereck:       

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNW: NA Kessel:        Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NW: NA Kessel: IIA Viereck:       

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS  
CODES for  
LARGEST TREES,  
SHRUBS,  
NON-WOODY  
PLANTS, &  
GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 75 % coniferous: 10

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees	
		3-5	5-9	9-21	> 21	DBH class	Cover class
1. <u>BETPAP</u>	<u>88</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>7</u>
2. <u>PORTB</u>	<u>2</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>4</u>	<u>3</u>
3. <u>PICGLA</u>	<u>10</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>4</u>
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>BETPAP</u>	<u>5</u>	<u>2.0</u>	<u>2</u>
2. <u>PICGLA</u>	<u>1</u>	<u>2.0</u>	<u>2</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>0.5</u>	<u>4</u>	<u>VACULI</u>
2.	<u>1.0</u>	<u>3</u>	<u>VIBES</u>
3.	<u>0.2</u>	<u>4</u>	<u>VACUIT</u>
4.	<u>0.2</u>	<u>4</u>	<u>EMP NIG</u>
	<u>1.0</u>	<u>4</u>	<u>SPISPI</u>

## NON-WOODY

## PLANTS

Graminoids

Herbs

Ferns

Horsetails

Cover class Species (list by dominance)

<u>5</u>	<u>GRASS + SEDGE</u>
<u>4</u>	<u>SEDGE; VIOLAN; ERANG; LINBOR</u>
<u>4</u>	<u>WOOD FERN; DRY FERN</u>
<u>3</u>	<u>      </u>

## GROUND COVER

Mosses/hepatics

Lichens

Litter

Bare ground

Ephemeral snow

<u>5</u>	<u>MOSS</u>
<u>3</u>	<u>      </u>
<u>4</u>	<u>LEAVES; STICKS</u>
<u>0</u>	<u>      </u>
<u>0</u>	<u>      </u>



Land unit: GRANT LAKE  
 Date: 16 JUNE 20  
 Observers: APA, RJB

 Block #:         
 Point #: GL#1

## TOPOGRAPHY

 Elevation (m) MAX Aspect 0° Slope 0°

## TOPOGRAPHIC POSITION

- ☐ Summit      ☐ Highslope      ☒ Basin  
☐ Ridge      ☐ Midslope      ☐ Valley  
☐ Lowslope      ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face      ☐ Step in slope      ☐ Alluvia/moraine  
☐ Cut-bank      ☐ Floodplain      ☐ Dunes  
☒ Other MIDGE PASS

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North:        Facing South:         
 Facing East:        Facing West:       

## DISTURBANCE

☐ None

Type	% of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	<u>1/4</u>	<u>2</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	—
Other human disturbances	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other <u>EMILPOND</u>	<u>1/4</u>	<u>2</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	—

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

- No. coniferous snags: ☐ 1 ☐ 2 ☒ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☒ < 1 ☐ 1-5 ☒ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

 1. Is there a water body at least partly inside the 50-m radius circle? YES NO  
☐ ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

☐ Marine☐ Estuarine☐ River/Stream☐ Lake/Pond

Shore type and vegetation:

☐ Bedrock, boulders, large stones☐ Organic material, mud, sand, gravel, cobbles☐ < 30% vegetated☐ > 30% vegetated
 B. Is the water body at least 10 m wide? ☐ ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). ☐ ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). RR-TRACKS  
☒ ☐

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ ☐



Land unit: GRANT LAKE  
Block #: XXXXDate: 16 JUNE 2013  
Observers: ARA; RJBPoint #: GL#2  
Habitat # 1 of 1  
% of circle: 100 - GEMCA-45%

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW1: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW1: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 3. Vegetated wetland without open water body.  
NW1: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW1: NA Kessel: \_\_\_\_\_ Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NW1: NA Kessel: VLC Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 90 % coniferous: 85

TREE LAYER species	% cover	Avg. ht. (m)				DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PCGLA</u>	<u>85</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>7</u>
2. <u>BETPA</u>	<u>14</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>4</u>
3. <u>ALNCR</u>	<u>1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>	<u>3</u>
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>PCGLA</u>	<u>10</u>	<u>1.5</u>	<u>2</u>
2. <u>BETPA</u>	<u>2</u>	<u>1.5</u>	<u>2</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>1.5</u>	<u>4</u>	<u>SALSPA</u>
2.	<u>0.2</u>	<u>4</u>	<u>EMPNG</u>
3.	<u>0.5</u>	<u>4</u>	<u>VACUL</u>
4.	<u>0.2</u>	<u>4</u>	<u>LINBOR</u>

NON-WOODY  
PLANTS

	Cover class	Species (list by dominance)
Graminoids	<u>3</u>	<u>GRASS</u>
Herbs	<u>3</u>	<u>GERLIV; GERPER; BETANG;</u>
Ferns	<u>4</u>	<u>ORR + WOOD</u>
Horsetails	<u>3</u>	_____

## GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>3</u>	_____
Litter	<u>4</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____



Land unit: GRANT LAKE  
 Date: 16 JUNE 2013  
 Observers: APA, RJB
Block #:       Point #: GL#2

## TOPOGRAPHY

 Elevation (m) MAP Aspect 80° Slope 20°

## TOPOGRAPHIC POSITION

- ☐ Summit      ☐ Highslope      ☐ Basin  
☐ Ridge      ☒ Midslope      ☐ Valley  
☐ Lowslope      ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face      ☐ Step in slope      ☐ Alluvia/moraine  
☐ Cut-bank      ☐ Floodplain      ☐ Dunes  
☒ Other RIVER VALLEY - GRANT CREEK

## PHOTO

 Roll/frame or  
Digital ID #
Facing North:       Facing South:       Facing East:       Facing West:       

## DISTURBANCE

☒ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2

&gt; 2

# if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other human disturbances	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

- No. coniferous snags: ☐ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☒ 10-12 ☐ >12  
 No. deciduous snags: ☐ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☒ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☐ < 1 ☐ 1-5 ☒ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

 1. Is there a water body at least partly inside the 50-m radius circle? YES ☒ NO ☐

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☒ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☒ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

 B. Is the water body at least 10 m wide? YES ☒ NO ☐

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #:                     Date: 16 JUL 2013  
Observers: APAS RJBPoint #: GL#3  
Habitat # 1 of 1  
% of circle: 100% - GRANT CR (90%)

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW:        Kessel:        Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW:        Kessel:        Viereck:
- ☐ 3. Vegetated wetland without open water body.  
NW:        Kessel:        Viereck:
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock    ☐ Bare soil    ☐ Persistent snow or ice  
☐ Rocks, stones, gravel    ☐ Sand  
 NW: NA Kessel:        Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel: ILC Viereck:

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 85 % coniferous: 50

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees	
		3-5	5-9	9-21	> 21	DBH class	Cover class
1. <u>BETPM</u>	<u>50</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
2. <u>PICGLA</u>	<u>50</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
3. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>
4. <u>      </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>NOT OBSERVED</u>	<u>0</u>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>
2. <u>      </u>	<u>0</u>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<input type="checkbox"/>	<u>4</u>	<u>VIBEDU</u>
2.	<input type="checkbox"/>	<u>4</u>	<u>ROSACE</u>
3.	<input type="checkbox"/>	<u>3</u>	<u>OPLHOR</u>
4.	<input type="checkbox"/>	<u>3</u>	<u>CORCAN</u>

NON-WOODY  
PLANTS

	Cover class	Species (list by dominance)
Graminoids	<u>4</u>	<u>GRASS</u>
Herbs	<u>4</u>	<u>PIEDM; STRAMP; GERERI; GATR</u>
Ferns	<u>5</u>	<u>ORL + WOOD</u>
Horsetails	<u>4</u>	<u>      </u>

## GROUND COVER

Mosses/hepatics	<u>5</u>	<u>MOSS</u>
Lichens	<u>3</u>	<u>      </u>
Litter	<u>6</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	<u>      </u>
Ephemeral snow	<u>0</u>	<u>      </u>



Land unit: GRANT LAKE  
 Date: 16 JUNE 2013  
 Observers: APA: RJB
Block #:           Point #: 61#3

## TOPOGRAPHY

 Elevation (m) 1110 Aspect 0° Slope 0°

## TOPOGRAPHIC POSITION

- ☐ Summit      ☐ Highslope      ☐ Basin  
☐ Ridge      ☐ Midslope      ☒ Valley  
☐ Lowslope      ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face      ☐ Step in slope      ☐ Alluvia/moraine  
☐ Cut-bank      ☐ Floodplain      ☐ Dunes  
☒ Other GRANT CR. BANK

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North:            Facing South:             
 Facing East:            Facing West:           

## DISTURBANCE

☐ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Disease	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver ponds	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Beaver cuttings	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other animal activity	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Fire	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Flooding	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Wind	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Landslide/avalanche	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Logging	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Roads	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—
Other human disturbances	<u>2</u>	<u>1</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	—
Other	—	—	<input type="checkbox"/>	<input type="checkbox"/>	—

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☐ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☒ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☐ < 1 ☒ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

 1. Is there a water body at least partly inside the 50-m radius circle? YES ☒ NO ☐

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☒ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☒ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

 B. Is the water body at least 10 m wide? YES ☒ NO ☐

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #:                     Date: 16 JUL 2013  
Observers: AKA, RJBPoint #: GR #4  
Habitat # 1 of 1  
% of circle: 100

## CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW:        Kessel:        Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW:        Kessel:        Viereck:
- ☐ 3. Vegetated wetland without open water body.  
NW:        Kessel:        Viereck:
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel:        Viereck: NA
- ☒ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel: VLB Viereck:

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PICGLA</u>	<u>90</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>5</u>	<u>7</u>
2. <u>BETPAP</u>	<u>5</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>3</u>
3. <u>MINCRI</u>	<u>5</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>	<u>3</u>
4. <u>          </u>	<u>      </u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>      </u>	<u>      </u>

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>PICGLA</u>	<u>2</u>	<u>2</u> <u>4</u>	<u>2</u>
2. <u>BETPAP</u>	<u>2</u>	<u>2</u> <u>4</u>	<u>2</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>1.5</u>	<u>5</u>	<u>MEXFER</u>
2.	<u>0.8</u>	<u>4</u>	<u>LEDGRD</u>
3.	<u>1.0</u>	<u>4</u>	<u>RIBTRI</u>
4.	<u>1.0</u>	<u>4</u>	<u>OPLHOR</u>

NON-WOODY  
PLANTS

	Cover class	Species (list by dominance)
Graminoids	<u>6</u>	<u>GRASS</u>
Herbs	<u>3</u>	<u>TRIARC</u>
Ferns	<u>4</u>	<u>OPR &amp; WOOD</u>
Horsetails	<u>4</u>	<u>          </u>

## GROUND COVER

Mosses/hepatics	<u>4</u>	<u>MOSS</u>
Lichens	<u>2</u>	<u>          </u>
Litter	<u>7</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	<u>          </u>
Ephemeral snow	<u>0</u>	<u>          </u>



Land unit: GRANT LAKE  
 Date: 16 JUNE 2013  
 Observers: ARA'S RJB

 Block #: ~~XXXX~~  
 Point #: GL#4

## TOPOGRAPHY

 Elevation (m) 1112 Aspect NNW° Slope 15°

## TOPOGRAPHIC POSITION

- |                                 |  |                                 |
|---------------------------------|--|---------------------------------|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope           | <input type="checkbox"/> Basin  |
| <input type="checkbox"/> Ridge  | <input checked="" type="checkbox"/> Midslope | <input type="checkbox"/> Valley |
|                                 | <input type="checkbox"/> Lowslope            | <input type="checkbox"/> Plain  |

## LOCAL FEATURES

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Cliff/rock face                              | <input type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank                                     | <input type="checkbox"/> Floodplain    | <input type="checkbox"/> Dunes           |
| <input checked="" type="checkbox"/> Other <u>VALLEY FOR GRANT CR.</u> |  |  |

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North: \_\_\_\_\_ Facing South: \_\_\_\_\_  
 Facing East: \_\_\_\_\_ Facing West: \_\_\_\_\_

## DISTURBANCE

☐ None

Type	% of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	<u>60</u>	<u>2</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Wind	<u>60</u>	<u>2</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## DISTURBANCE SEVERITY CODES

1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.

2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags:	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input checked="" type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input type="checkbox"/> >12
No. deciduous snags:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3-4	<input type="checkbox"/> 5-6	<input type="checkbox"/> 7-9	<input type="checkbox"/> 10-12	<input type="checkbox"/> >12
% cover downed logs:	<input type="checkbox"/> << 1	<input type="checkbox"/> < 1	<input type="checkbox"/> 1-5	<input type="checkbox"/> 6-25	<input type="checkbox"/> 26-50	<input checked="" type="checkbox"/> 51-75	<input type="checkbox"/> 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

 1. Is there a water body at least partly inside the 50-m radius circle? YES ☐ NO ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐
- Marine
- 
- ☐
- Estuarine
- 
- ☐
- River/Stream
- 
- ☐
- Lake/Pond

Shore type and vegetation:

- ☐
- Bedrock, boulders, large stones
- 
- ☐
- Organic material, mud, sand, gravel, cobbles
- 
- ☐
- < 30% vegetated
- 
- ☐
- > 30% vegetated

 B. Is the water body at least 10 m wide? YES ☐ NO ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists). YES ☐ NO ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius). YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☒ NO ☐



Land unit: GRANT LAKE  
Block #: XXXXDate: 16 JUNE 2013  
Observers: APAS RJBPoint #: GLAS  
Habitat # 1 of 2  
% of circle: 70

## CLASSIFICATION

- ☐
1. Water body with no floating or emergent vegetation.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA

- ☐
2. Water body with > 2% vegetation cover.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: -

- ☐
3. Vegetated wetland without open water body.

NWI: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

- ☐
4. Non-wetland with < 2% vegetation.

☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice☐ Rocks, stones, gravel ☐ SandNWI: NA Kessel: \_\_\_\_\_ Viereck: NA

- ☒
5. Non-wetland with > 2% vegetation cover.

NWI: NA Kessel: ILC Viereck: \_\_\_\_\_

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER	Code	% cover	Code	% cover
	0	None	4	6-25 %
	1	<< 1 %	5	26-50 %
	2	< 1 %	6	51-75 %
	3	1-5 %	7	76-100 %

## VEGETATION

## SINGLE-STEMMED TREES &gt; 3 m

% TREE canopy cover: 85 % coniferous: 60

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PICULA</u>	<u>60</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>6</u>
2. <u>BETPAP</u>	<u>40</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>	<u>5</u>
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES &lt; 3 m

Species (list for each layer) % cover Avg. ht. (m) Avg. DBH class

1. <u>PICULA</u>	<u>3</u>	<u>15</u>	<u>N/A</u>
2. <u>BETPAP</u>	<u>1</u>	<u>20</u>	<u>2</u>

## SHRUBS (Multiple-stemmed, woody plants)

Layer Avg. ht. (m) Cover class Species (list for each layer)

1.	<u>10</u>	<u>4</u>	<u>MONFOR</u>
2.	<u>02</u>	<u>4</u>	<u>LINEOR</u>
3.	<u>10</u>	<u>4</u>	<u>VIBEDU</u>
4.	<u>10</u>	<u>4</u>	<u>POSACE</u>

NON-WOODY  
PLANTS

Cover class	Species (list by dominance)
<u>4</u>	<u>GRASS</u>
<u>4</u>	<u>PICULA; GERPER; SPIANG; EMPNIG</u>
<u>4</u>	<u>ORR FERN</u>
<u>3</u>	_____

## GROUND COVER

Mosses/hepatics	<u>6</u>	<u>MOSS</u>
Lichens	<u>2</u>	_____
Litter	<u>5</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____



Land unit: GRANT LAKE  
 Date: 16 JUNE 2013  
 Observers: APAS, RJB

 Block #: XXXX  
 Point #: GL#5

## TOPOGRAPHY

 Elevation (m) 1117 Aspect 120° Slope 8°

## TOPOGRAPHIC POSITION

- ☐ Summit ☐ Highslope ☐ Basin  
☐ Ridge ☐ Midslope ☐ Valley  
☒ Lowslope ☐ Plain

## LOCAL FEATURES

- ☐ Cliff/rock face ☒ Step in slope ☐ Alluvia/moraine  
☐ Cut-bank ☐ Floodplain ☐ Dunes  
☐ Other \_\_\_\_\_

## PHOTO

 Roll/frame or  
Digital ID #

 Facing North: \_\_\_\_\_ Facing South: \_\_\_\_\_  
 Facing East: \_\_\_\_\_ Facing West: \_\_\_\_\_

## DISTURBANCE

☒ None

Type	% of circle	Severity code	Yrs since disturbance		
			< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

## DISTURBANCE SEVERITY CODES

- 1 MINOR: Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.
- 2 SEVERE: Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.

## COARSE WOODY DEBRIS (Within 50-m radius circle)

No. coniferous snags: ☐ 1 ☐ 2 ☒ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 No. deciduous snags: ☒ 1 ☐ 2 ☐ 3-4 ☐ 5-6 ☐ 7-9 ☐ 10-12 ☐ >12  
 % cover downed logs: ☐ << 1 ☐ < 1 ☒ 1-5 ☐ 6-25 ☐ 26-50 ☐ 51-75 ☐ 76-100%

## HABITAT QUESTIONNAIRE

(Answer all questions for each point.)

1. Is there a water body at least partly inside the 50-m radius circle?
- YES NO  
☐ ☒

A. If YES, indicate the water type, shore type, and shore vegetation.

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

- B. Is the water body at least 10 m wide?
- ☐ ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be > 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists).
- ☐ ☒

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m
- <sup>2</sup>
- in size (11-m radius).
- ☐ ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).

For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? ☒ ☐



Land unit: GRANT LAKE  
Block #: X

Date: 16 JUNE 2013  
Observers: APA, RJB

Point #: GL#5  
Habitat # 2 of 2  
% of circle: 34

CLASSIFICATION

- ☐ 1. Water body with no floating or emergent vegetation.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 2. Water body with > 2% vegetation cover.  
NW: \_\_\_\_\_ Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_
- ☒ 3. Vegetated wetland without open water body.  
NW: \_\_\_\_\_ Kessel: IVa Viereck: \_\_\_\_\_
- ☐ 4. Non-wetland with < 2% vegetation.  
☐ Solid bedrock ☐ Bare soil ☐ Persistent snow or ice  
☐ Rocks, stones, gravel ☐ Sand  
NW: NA Kessel: \_\_\_\_\_ Viereck: NA
- ☐ 5. Non-wetland with > 2% vegetation cover.  
NW: NA Kessel: \_\_\_\_\_ Viereck: \_\_\_\_\_

VEGETATION

SINGLE-STEMMED TREES > 3 m

% TREE canopy cover: 7 % coniferous: 100

TREE LAYER species	% cover	Avg. ht. (m)				Largest trees DBH class	Cover class
		3-5	5-9	9-21	> 21		
1. <u>PICGLA</u>	<u>100</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>	<u>7</u>
2. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
3. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. _____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

SINGLE-STEMMED SAPLINGS, SEEDLINGS, OR DWARF TREES < 3 m

Species (list for each layer)	% cover	Avg. ht. (m)	Avg. DBH class
1. <u>PICGLA</u>	<u>1</u>	<u>10</u>	<u>N/A</u>
2. _____	_____	_____	_____

SHRUBS (Multiple-stemmed, woody plants)

Layer	Avg. ht. (m)	Cover class	Species (list for each layer)
1.	<u>0.8</u>	<u>6</u>	<u>SAUSPA</u>
2.	<u>0.7</u>	<u>4</u>	<u>BETGLA</u>
3.	<u>0.5</u>	<u>3</u>	<u>VIBEDU</u>
4.	<u>0.1</u>	<u>3</u>	<u>ANDPOL</u>

NON-WOODY PLANTS

Cover class	Species (list by dominance)
<u>5</u>	<u>GRASS</u>
<u>3</u>	<u>PIRPA, POTPA, ANERIC, VIDLAN</u>
<u>0</u>	_____
<u>5</u>	_____

GROUND COVER

Mosses/hepatics	<u>7</u>	<u>MOSS</u>
Lichens	<u>0</u>	_____
Litter	<u>6</u>	<u>LEAVES / STICKS</u>
Bare ground	<u>0</u>	_____
Ephemeral snow	<u>0</u>	_____

TREE size class	DBH Code	DBH (in)		DBH (cm)	
		Coniferous	Deciduous	Coniferous	Deciduous
Seedling	1	< 1.0	< 1.0	< 2.5	< 2.5
Sapling	2	1.0-4.9	1.0-4.9	2.5-13	2.5-13
Poletimber	3	5-8.9	5-10.9	14-23	14-28
Small Sawtimber	4	9-19.9	11-19.9	23-49	28-49
Large Sawtimber	5	20-39.9	20-39.9	50-101	50-101
Giant Sawtimber	6	> 40	> 40	> 102	> 102

COVER CLASS CODES for LARGEST TREES, SHRUBS, NON-WOODY PLANTS, & GROUND COVER

Code	% cover	Code	% cover
0	None	4	6-25 %
1	<< 1 %	5	26-50 %
2	< 1 %	6	51-75 %
3	1-5 %	7	76-100 %



**ALMS****HABITAT POINT DATA**Land unit: GRANT LAKEBlock #: XXXXDate: 16 JUNE 2013Point #: GL#5Observers: ARR; RJB**TOPOGRAPHY**Elevation (m) 1112 Aspect 0° Slope 0°**TOPOGRAPHIC POSITION**

- |                                 |                                    |   |
|---------------------------------|------------------------------------|---|
| <input type="checkbox"/> Summit | <input type="checkbox"/> Highslope | <input checked="" type="checkbox"/> Basin |
| <input type="checkbox"/> Ridge  | <input type="checkbox"/> Midslope  | <input type="checkbox"/> Valley           |
|                                 | <input type="checkbox"/> Lowslope  | <input type="checkbox"/> Plain            |

**LOCAL FEATURES**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cliff/rock face                 | <input type="checkbox"/> Step in slope | <input type="checkbox"/> Alluvia/moraine |
| <input type="checkbox"/> Cut-bank                        | <input type="checkbox"/> Floodplain    | <input type="checkbox"/> Dunes           |
| <input checked="" type="checkbox"/> Other <u>WETLAND</u> |  |  |

**PHOTO**Roll/frame or  
Digital ID #Facing North: / Facing South: /  
Facing East: / Facing West: /**DISTURBANCE**☒ None% of  
circleSeverity  
code

Yrs since disturbance

&lt; 2 &gt; 2 # if known

Type	% of circle	Severity code	< 2	> 2	# if known
Insect damage	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disease	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver ponds	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beaver cuttings	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other animal activity	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Flooding	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Wind	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Landslide/avalanche	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Logging	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roads	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other human disturbances	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

**DISTURBANCE SEVERITY CODES****1 MINOR:** Little evidence of disturbance, damage limited to small part of circle, or widespread but slight. Minor driver for succession.**2 SEVERE:** Damage obvious and widespread in circle, including killing or removing much of the vegetation or underlying substrate. Damage resulting in widespread secondary succession.**COARSE WOODY DEBRIS** (Within 50-m radius circle)

- |                       |  |                              |                              |   |                                |                                |                                  |
|-----------------------|--|------------------------------|------------------------------|---|--------------------------------|--------------------------------|----------------------------------|
| No. coniferous snags: | <input type="checkbox"/> 1               | <input type="checkbox"/> 2   | <input type="checkbox"/> 3-4 | <input checked="" type="checkbox"/> 5-6 | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| No. deciduous snags:  | <input checked="" type="checkbox"/> 1    | <input type="checkbox"/> 2   | <input type="checkbox"/> 3-4 | <input type="checkbox"/> 5-6            | <input type="checkbox"/> 7-9   | <input type="checkbox"/> 10-12 | <input type="checkbox"/> >12     |
| % cover downed logs:  | <input checked="" type="checkbox"/> << 1 | <input type="checkbox"/> < 1 | <input type="checkbox"/> 1-5 | <input type="checkbox"/> 6-25           | <input type="checkbox"/> 26-50 | <input type="checkbox"/> 51-75 | <input type="checkbox"/> 76-100% |

**HABITAT QUESTIONNAIRE**

(Answer all questions for each point.)

**1. Is there a water body at least partly inside the 50-m radius circle?** YES ☐ NO ☒**A. If YES, indicate the water type, shore type, and shore vegetation.**

Water type:

- ☐ Marine  
☐ Estuarine  
☐ River/Stream  
☐ Lake/Pond

Shore type and vegetation:

- ☐ Bedrock, boulders, large stones  
☐ Organic material, mud, sand, gravel, cobbles  
☐ < 30% vegetated  
☐ > 30% vegetated

**B. Is the water body at least 10 m wide?** YES ☐ NO ☒

If YES, this is wetland habitat. If part of water body is vegetated and part unvegetated, there may be &gt; 1 habitat. Use NWI Key to determine wetland classes and fill out HABITAT DESCRIPTION form for each one.

**2. Apart from water bodies described above, is saturation with water the dominant factor in determining soil development and plant community for any other habitat > 10 m wide occurring at least partly in the circle? This includes areas at least annually saturated with or covered by water, areas dotted with small ponds, and areas with obligate wetland plants or numerous facultative wetland species (see NWI wetland indicator lists).** YES ☒ NO ☐

If YES, this is a separate wetland habitat. Use NWI Key to determine wetland class and fill out HABITAT DESCRIPTION form.

**3. Is there a large patch of unvegetated ground, not associated with a water body, that is at least partly inside the 50-m circle? This can include rock, bare ground, or snow or ice with no protruding vegetation, but the patch must be at least 400 m<sup>2</sup> in size (11-m radius).** YES ☐ NO ☒

If YES, this is a separate habitat; fill out HABITAT DESCRIPTION form.

**4. For any other parts of the 50-m radius circle, fill out one HABITAT DESCRIPTION form for each discrete non-wetland habitat type. DO NOT separate out components of common habitat mosaics (see instructions).**For any of these habitats, is the soil very well drained, unable to hold moisture long after precipitation, and dry most of the year? YES ☐ NO ☒



**ALMS****SURVEY DETAILS**

(Circle appropriate values)

Length of count (min): 3 5 8 10 other \_\_\_\_\_Spacing between pts (m): 250 500Observers rotated among pts: yes noDouble-observer method used: yes no

Species counted in restricted radius (\_\_\_\_m): \_\_\_\_\_

Species excluded from point counts: \_\_\_\_\_

**OBSERVER INFORMATION**Name: AMAL R ASMI

First name

Middle initial

Last name

Affiliation: ERM, ALASKA INC.Address: P.O. Box 85207City: FAIRBANKS State: AK Zip: 99708Tel: \_\_\_\_\_ email: amal.ajmi@erm.com**SURVEY EXPERIENCE (# years):**Bird surveys X Distance estimation 8+ Birding in Alaska 15+**CONTACT INFORMATION**

(If different)

Name: \_\_\_\_\_

First name

Middle initial

Last name

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Tel: \_\_\_\_\_ email: \_\_\_\_\_

**DAILY WEATHER AND ROUTE**Land unit: GRANT LAKE MAY 2013

Block number: \_\_\_\_\_

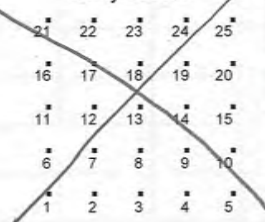
Block name: \_\_\_\_\_

Date: 052113

(mm-dd-yy)

	Start	End	
Time	<u>0531</u>	<u>0900</u>	
Temp	<u>~35</u>	<u>~45</u>	°F/C
Wind	<u>0</u>	<u>0</u>	
Sky	<u>0</u>	<u>0</u>	

Daily route:



Show path between survey points each day. Circle points done by this observer if observers were rotated.

Date: \_\_\_\_\_

(mm-dd-yy)

	Start	End	
Time			
Temp			°F/C
Wind			
Sky			

Daily route:

Date: 052213

(mm-dd-yy)

	Start	End	
Time	<u>0531</u>	<u>0832</u>	
Temp	<u>~38</u>	<u>~50</u>	°F/C
Wind	<u>0</u>	<u>1</u>	
Sky	<u>2</u>	<u>2</u>	

Daily route:

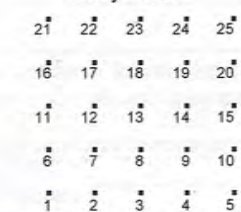


Date: \_\_\_\_\_

(mm-dd-yy)

	Start	End	
Time			
Temp			°F/C
Wind			
Sky			

Daily route:





**ALMS****LOCATION DATA**GPS type & no: GRANT E TREX  
GPS datum: NAD83 VISTA CLand unit: GRANT LAKE  
Dates: 21, 22 MAY 2013Block number: \_\_\_\_\_  
Block name: \_\_\_\_\_

Waypt #	Pt	Latitude (N)								Longitude (W or E)								Location error (m)	Elev (m)	Altim GPS Map	Moved FROM orig pt		Photo		Notes about point and survey markers (give reason if point moved or inaccessible)
		d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d				Distance (m)	Bearing	#	Dir	
	1	6	0	4	5	7	8	5	1	4	9	3	6	7	4	5	± 7								
	2	6	0	4	5	7	1	9	1	4	9	3	6	3	3	6	± 1								
	3	6	0	4	5	7	1	7	1	4	9	3	6	2	5	1	± 0								
	4	6	0	4	5	5	4	9	1	4	9	3	5	9	4	5	± 0								
	5	6	0	4	5	4	3	6	1	4	9	3	5	5	4	9	± 0								
	6	6	0	4	5	5	1	8	1	4	9	3	5	1	2	8	± 0								
	7	6	0	4	5	7	3	2	1	4	9	3	5	2	4	3	± 0								
	8	6	0	4	5	7	0	4	1	4	9	3	4	9	9	8	± 0								
	9	6	0	4	5	3	9	1	1	4	9	3	4	9	7	1	± 4								
	10	6	0	4	5	7	6	9	1	4	9	3	4	4	9	3	± 0								
	11	6	0	4	5	8	6	6	1	4	9	3	4	0	7	7	± 0								
	12	6	0	4	5	9	3	9	1	4	9	3	3	6	4	9	± 1								
	13	6	0	4	6	0	9	1	1	4	9	3	3	5	1	6	± 5								
	14	6	0	4	6	1	2	1	1	4	9	3	3	7	9	0	± 1								
	15																±								
	16																±								
	17																±								
	18																±								
	19																±								
	20																±								
	21																±								
	22																±								
	23																±								
	24																±								
	25																±								

[illegible]



### LIST OF BIRDS DETECTED DURING SURVEY

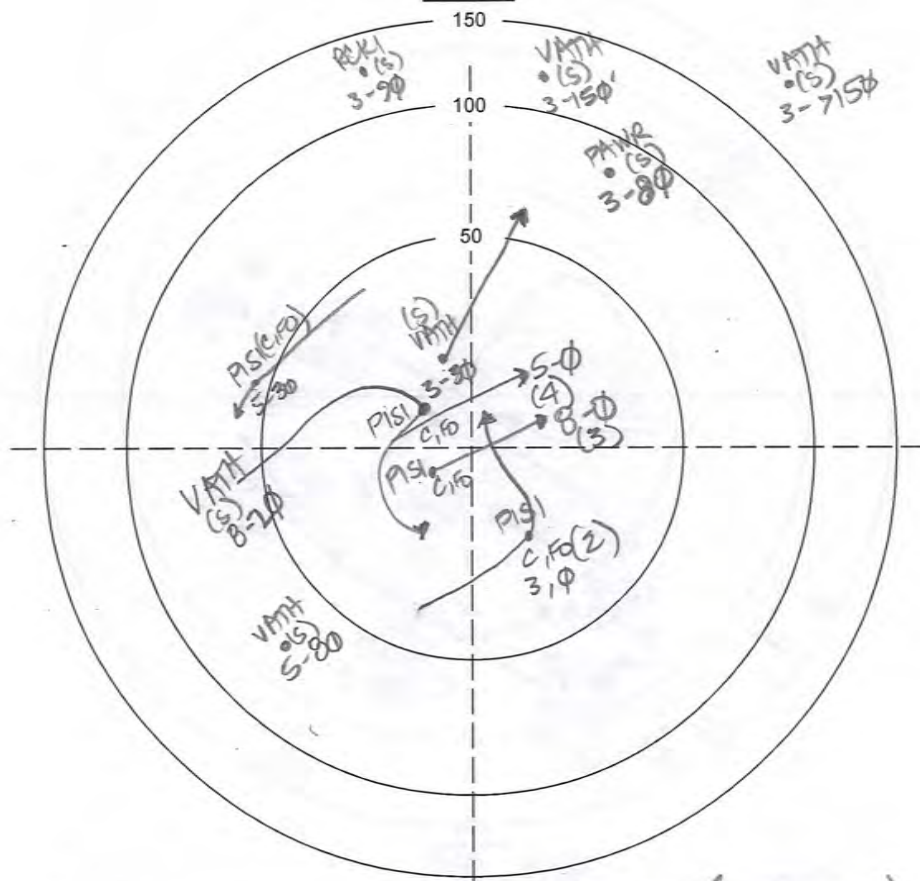




### MAP OF BIRDS DETECTED DURING SURVEY

Date: 21 MAY 2013  
Time start: 0714  
60° 458; -149.341  
NR083

Direction  
315°



Species between this and previous point: PISI, PAWR (PACIFIC WREN)

Non-landbird species present but not counted:

Mammals: MOOSE DROPPINGS & PRINTS IN SNOW

Notes: UP ON RIDGE ABOVE CREEK, MOSS / W. HEMLOCK.

USGS Alaska Science Center May 2004

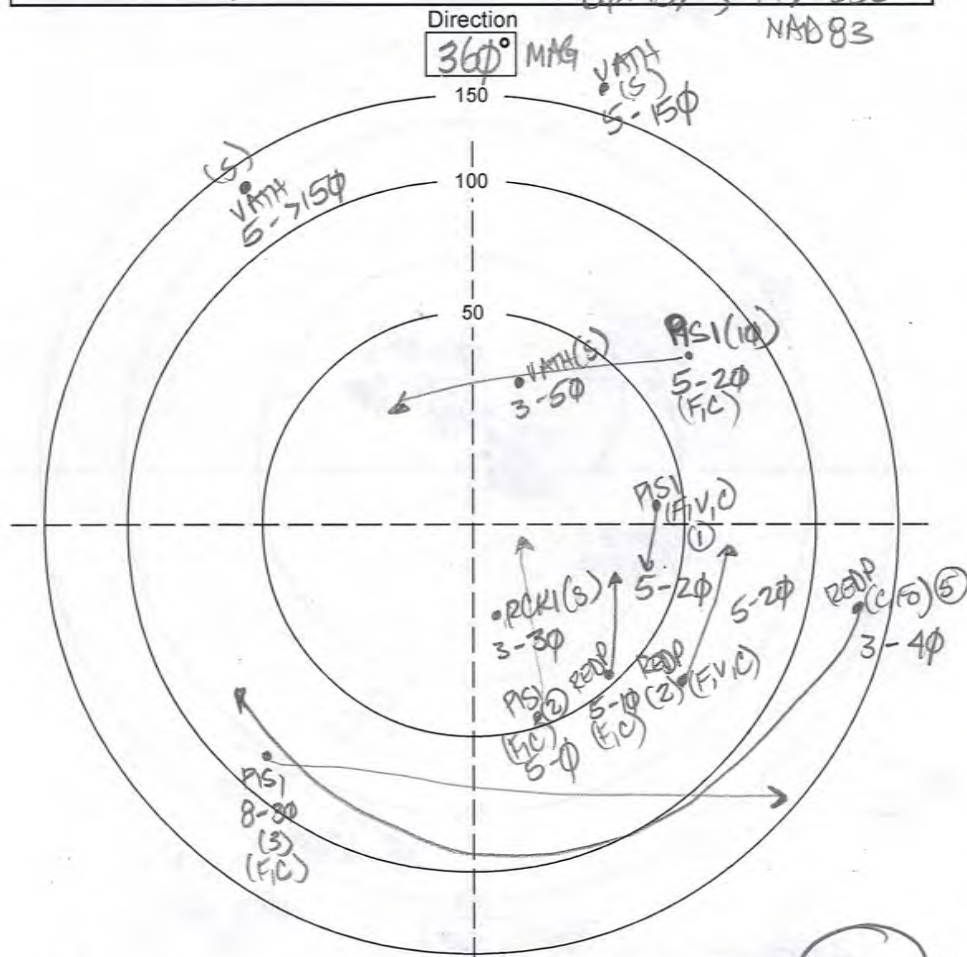
[illegible]

VATH 5-30

EX

### MAP OF BIRDS DETECTED DURING SURVEY

Date: 21 MAY 2013  
Time start: 0745  
60° 45' N ; -149° 33' W  
NAD83



Non-landbird species present but not counted:

Mammals: MOOSE DROPPINGS EVERYWHERE

Notes: ON RIDGE, MOSS / W. HENLOCK.

USGS Alaska Science Center May 2004

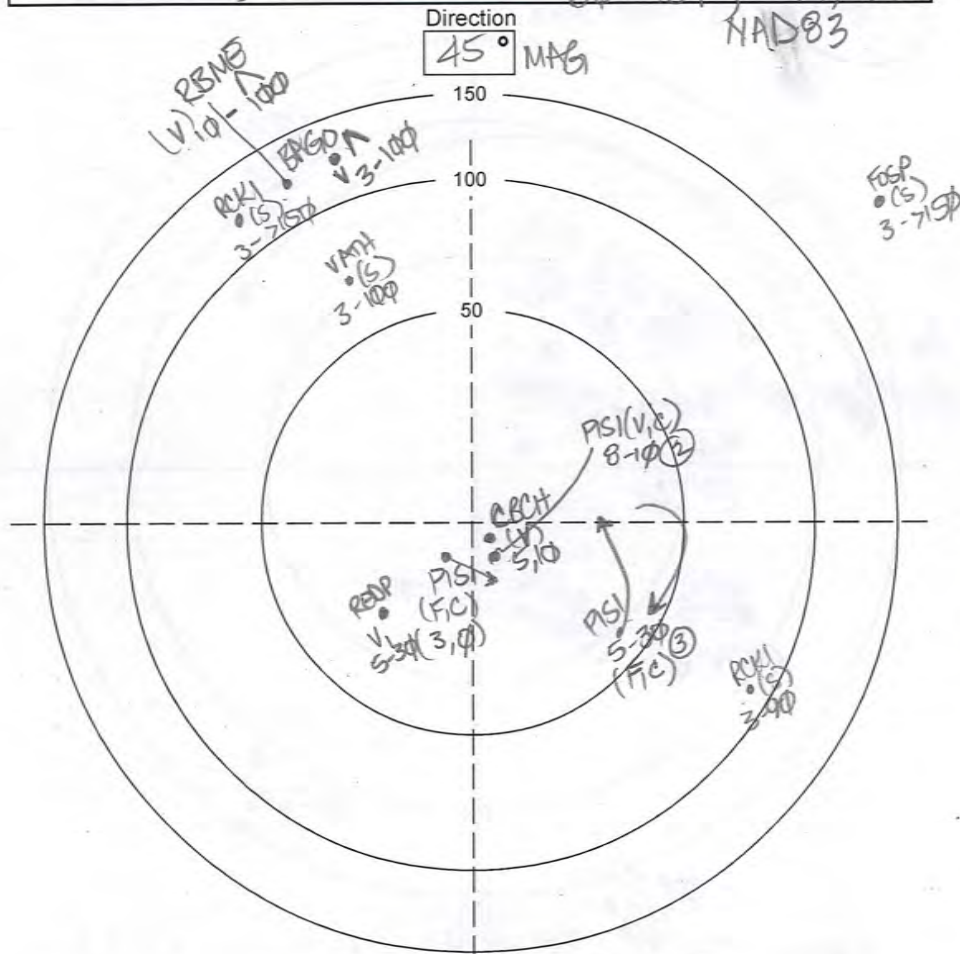
### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

VATH S-30



Date: 21 MAY 2013  
Time start: 08:18  
00:46 | -149.335  
NAD83



Species between this and previous point: VATH; TDWA;

Non-landbird species present but not counted: \_\_\_\_\_

Mammals: MOOSE DROPPINGS EVERYWHERE

Notes: LAKE SHORE

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]





[illegible]

### MAP OF BIRDS DETECTED DURING SURVEY

Block #: GRANT LAKE  
Point #: GRANT LAKE # 6  
Observer: MRA; RJB

Date: 22 MAY 2013  
Time start: 0554  
60° 45' 2" - 149.3513

NAD83



Species between this and previous point: VANH; RCR1;

Non-landbird species present but not counted: \_\_\_\_\_

Mammals: NOODLE DROPPINGS EVERYWHERE

Notes: Humulus, Spruce

USGS Alaska Science Center May 2004

VATH 5-30

### LIST OF BIRDS DETECTED DURING SURVEY

[illegible]



### MAP OF BIRDS DETECTED DURING SURVEY

Date: 22 MAY 2013  
Time start: 0624  
60° 45' 43" - 149.3555  
NAD83



Notes: Moss; Hemlock;

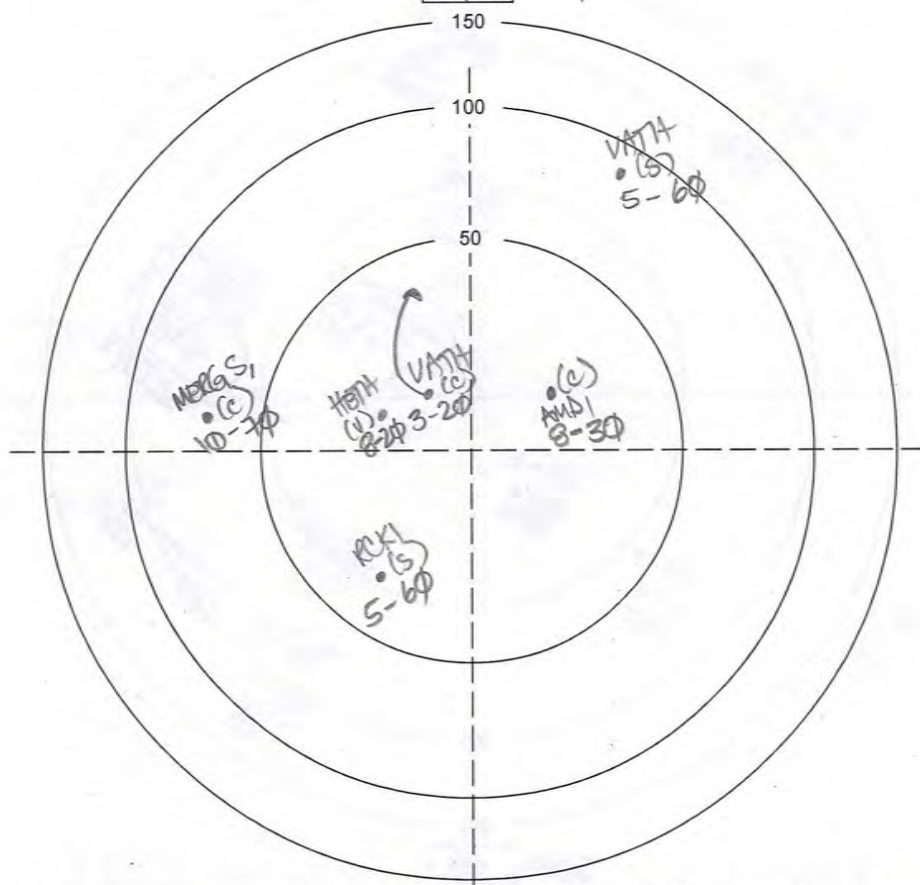
[illegible]

VATH 5-30



Date: 22 MAY 2013  
Time start: 0723  
60.4572; -149.3625  
NAD83

Direction  
315° MAG



Notes: CREEK + NARROWS LOUD.

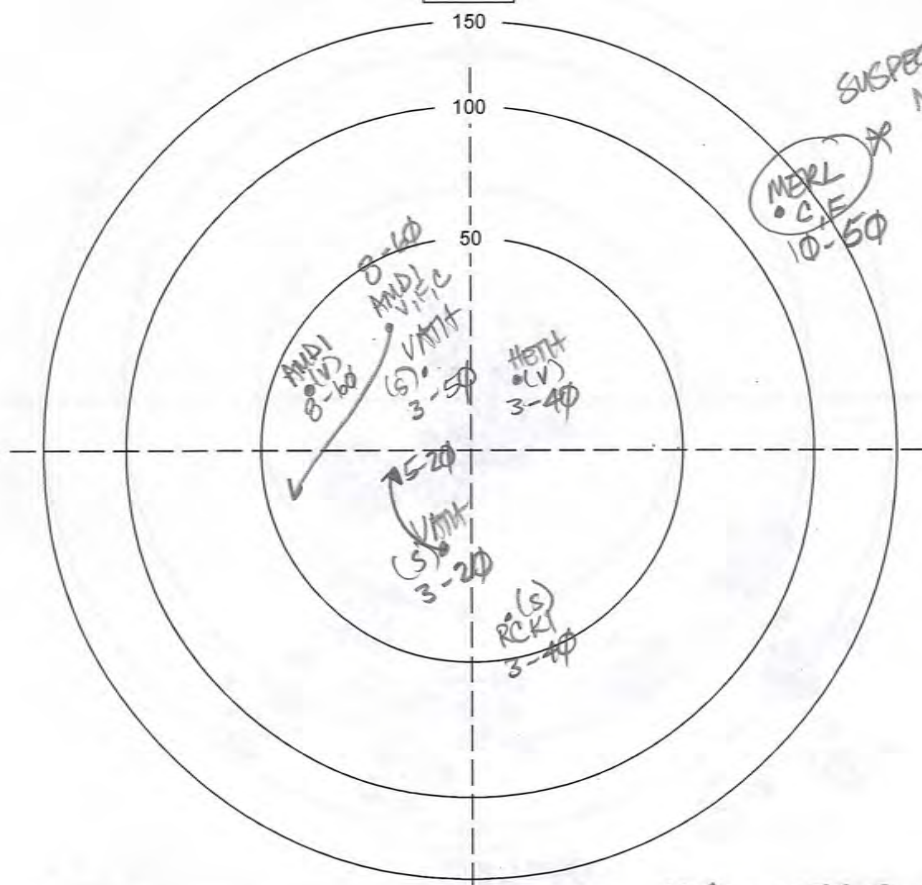
USGS Alaska Science Center May 2004

[illegible]

### MAP OF BIRDS DETECTED DURING SURVEY

NAD 83

MAG



SUSPECT A  
NEST.

~~NERL  
• C.E  
10-50~~

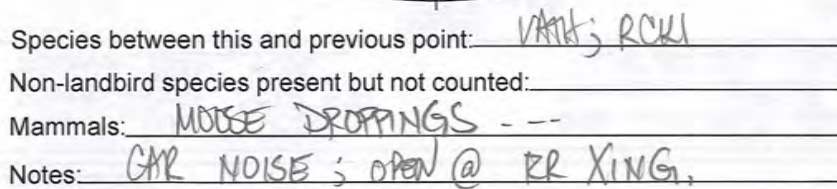
USGS Alaska Science Center May 2004

[illegible]

EX, VATH 5-30



MAD83



## LIST OF BIRDS DETECTED DURING SURVEY

[illegible]

**ALMS****BIRD AND MAMMAL SUMMARY CHECKLIST**

Land unit: GRANT LAKE WMA 2013 Dates: 21 MAY - 22 MAY 2013  
 Block number: \_\_\_\_\_ Observers: APA, RJB  
 Block name: \_\_\_\_\_ Total effort: \_\_\_\_\_ hrs \_\_\_\_\_ km

<input type="checkbox"/> RTLO	Red-throated Loon	<input type="checkbox"/> PAJA	Parasitic Jaeger
<input type="checkbox"/> PALO	Pacific Loon	<input type="checkbox"/> LTJA	Long-tailed Jaeger
<input type="checkbox"/> COLO	Common Loon	<input type="checkbox"/> BOGU	Bonaparte's Gull
<input type="checkbox"/> HOGR	Horned Grebe	<input type="checkbox"/> MEGU	Mew Gull
<input type="checkbox"/> RNGR	Red-necked Grebe	<input type="checkbox"/> HERG	Herring Gull
<input type="checkbox"/> PECO	Pelagic Cormorant	<input type="checkbox"/> GWGU	Glaucous-winged Gull
<input type="checkbox"/> TUSW	Tundra Swan	<input type="checkbox"/> GLGU	Glaucous Gull
<input type="checkbox"/> TRUS	Trumpeter Swan	<input type="checkbox"/> BLKI	Black-legged Kittiwake
<input type="checkbox"/> CAGO	Canada Goose	<input type="checkbox"/> ARTE	Arctic Tern
<input type="checkbox"/> GWTE	Green-winged Teal	<input type="checkbox"/> ALTE	Aleutian Tern
<input type="checkbox"/> MALL	Mallard	<input type="checkbox"/> COMU	Common Murre
<input type="checkbox"/> NOPI	Northern Pintail	<input type="checkbox"/> PIGU	Pigeon Guillemot
<input type="checkbox"/> NSHO	Northern Shoveler	<input type="checkbox"/> MAMU	Marbled Murrelet
<input type="checkbox"/> AMWI	American Wigeon	<input type="checkbox"/> TUPU	Tufted Puffin
<input type="checkbox"/> GRSC	Greater Scaup	<input type="checkbox"/> HOPU	Horned Puffin
<input type="checkbox"/> LESC	Lesser Scaup	<input type="checkbox"/> RODO	Rock Dove
<input type="checkbox"/> HARD	Harlequin Duck	<input type="checkbox"/> GHOW	Great Horned Owl
<input type="checkbox"/> LTDU	Long-tailed Duck	<input type="checkbox"/> NHOW	Northern Hawk Owl
<input type="checkbox"/> BLSC	Black Scoter	<input type="checkbox"/> BDOW	Barred Owl
<input type="checkbox"/> SUSC	Surf Scoter	<input type="checkbox"/> GGOW	Great Gray Owl
<input type="checkbox"/> WWSC	White-winged Scoter	<input type="checkbox"/> SEOW	Short-eared Owl
<input type="checkbox"/> COGO	Common Goldeneye	<input type="checkbox"/> BLSW	Black Swift
<input checked="" type="checkbox"/> BAGO	Barrow's Goldeneye	<input type="checkbox"/> VASW	Vaux's Swift
<input type="checkbox"/> BUFF	Bufflehead	<input type="checkbox"/> RUHU	Rufous Hummingbird
<input type="checkbox"/> COME	Common Merganser	<input type="checkbox"/> BEKI	Belted Kingfisher
<input checked="" type="checkbox"/> RBME	Red-breasted Merganser	<input type="checkbox"/> RBSA	Red-breasted Sapsucker
<input type="checkbox"/> OSPR	Osprey	<input type="checkbox"/> DOWO	Downy Woodpecker
<input checked="" type="checkbox"/> BAEA	Bald Eagle	<input type="checkbox"/> HAWO	Hairy Woodpecker
<input type="checkbox"/> NOHA	Northern Harrier	<input type="checkbox"/> TTWO	Three-toed Woodpecker
<input type="checkbox"/> SSHA	Sharp-shinned Hawk	<input type="checkbox"/> BBWO	Black-backed Woodpecker
<input type="checkbox"/> NOGO	Northern Goshawk	<input type="checkbox"/> NOFL	Northern Flicker
<input type="checkbox"/> SWHA	Swainson's Hawk	<input type="checkbox"/> YSFL	Yellow-shafted Flicker
<input type="checkbox"/> RTHA	Red-tailed Hawk	<input type="checkbox"/> RSFL	Red-shafted Flicker
<input type="checkbox"/> RLHA	Rough-legged Hawk	<input type="checkbox"/> OSFL	Olive-sided Flycatcher
<input type="checkbox"/> GOEA	Golden Eagle	<input type="checkbox"/> WEWP	Western Wood-Pewee
<input type="checkbox"/> AMKE	American Kestrel	<input type="checkbox"/> ALFL	Alder Flycatcher
<input checked="" type="checkbox"/> MERL	Merlin	<input type="checkbox"/> HAFL	Hammond's Flycatcher
<input type="checkbox"/> GYRF	Gyr Falcon	<input type="checkbox"/> PSFL	Pacific-slope Flycatcher
<input type="checkbox"/> SPGR	Spruce Grouse	<input type="checkbox"/> SAPH	Say's Phoebe
<input type="checkbox"/> BLUG	Blue Grouse	<input type="checkbox"/> HOLA	Horned Lark
<input type="checkbox"/> WIPT	Willow Ptarmigan	<input type="checkbox"/> TRES	Tree Swallow
<input type="checkbox"/> ROPT	Rock Ptarmigan	<input type="checkbox"/> VGSW	Violet-green Swallow
<input type="checkbox"/> SACR	Sandhill Crane	<input type="checkbox"/> NRWS	N. Rough-winged Swallow
<input type="checkbox"/> BBPL	Black-bellied Plover	<input type="checkbox"/> BANS	Bank Swallow
<input type="checkbox"/> AMGP	American Golden-Plover	<input type="checkbox"/> CLSW	Cliff Swallow
<input type="checkbox"/> PAGP	Pacific Golden-Plover	<input type="checkbox"/> BARS	Barn Swallow
<input type="checkbox"/> SEPL	Semipalmated Plover	<input type="checkbox"/> GRAJ	Gray Jay
<input type="checkbox"/> BLOY	Black Oystercatcher	<input type="checkbox"/> STJA	Steller's Jay
<input checked="" type="checkbox"/> GRYE	Greater Yellowlegs	<input type="checkbox"/> BBMA	Black-billed Magpie
<input type="checkbox"/> LEYE	Lesser Yellowlegs	<input type="checkbox"/> AMCR	American Crow
<input type="checkbox"/> SOSA	Solitary Sandpiper	<input type="checkbox"/> NOCR	Northwestern Crow
<input type="checkbox"/> SPSA	Spotted Sandpiper	<input type="checkbox"/> CORA	Common Raven
<input type="checkbox"/> UPSA	Upland Sandpiper	<input type="checkbox"/> BCCH	Black-capped Chickadee
<input type="checkbox"/> WHIM	Whimbrel	<input checked="" type="checkbox"/> BOCH	Boreal Chickadee
<input type="checkbox"/> SESA	Semipalmated Sandpiper	<input checked="" type="checkbox"/> CBCH	Chestnut-backed Chickadee
<input type="checkbox"/> WESA	Western Sandpiper	<input type="checkbox"/> RBNU	Red-breasted Nuthatch
<input type="checkbox"/> LESA	Least Sandpiper	<input checked="" type="checkbox"/> BRGR	Brown Creeper
<input type="checkbox"/> ROSA	Rock Sandpiper	<input checked="" type="checkbox"/> WIWR	Winter Wren
<input type="checkbox"/> DUNL	Dunlin	<input checked="" type="checkbox"/> AMDI	American Dipper
<input type="checkbox"/> WISN	Wilson's Snipe	<input type="checkbox"/> ARWA	Arctic Warbler
<input type="checkbox"/> RNPH	Red-necked Phalarope	<input type="checkbox"/> GCKI	Golden-crowned Kinglet

<input checked="" type="checkbox"/> RCKI	Ruby-crowned Kinglet
<input type="checkbox"/> BLUE	Bluebird
<input type="checkbox"/> NOWH	Northern Wheatear
<input type="checkbox"/> TOSO	Townsend's Solitaire
<input type="checkbox"/> GCTH	Gray-cheeked Thrush
<input type="checkbox"/> SWTH	Swainson's Thrush
<input checked="" type="checkbox"/> HETH	Hermit Thrush
<input checked="" type="checkbox"/> AMRO	American Robin
<input checked="" type="checkbox"/> VATH	Varied Thrush
<input type="checkbox"/> YWAG	Yellow Wagtail
<input type="checkbox"/> WHWA	White Wagtail
<input type="checkbox"/> AMPI	American Pipit
<input type="checkbox"/> BOWA	Bohemian Waxwing
<input type="checkbox"/> CEDW	Cedar Waxwing
<input type="checkbox"/> NSHR	Northern Shrike
<input type="checkbox"/> WAWI	Warbling Vireo
<input type="checkbox"/> REVI	Red-eyed Vireo
<input checked="" type="checkbox"/> OCWA	Orange-crowned Warbler
<input type="checkbox"/> YWAR	Yellow Warbler
<input checked="" type="checkbox"/> MYWA	Myrtle Warbler
<input type="checkbox"/> AUWA	Audubon's Warbler
<input type="checkbox"/> YRWA	Yellow-rumped Warbler
<input checked="" type="checkbox"/> TOWA	Townsend's Warbler
<input type="checkbox"/> BLPW	Blackpoll Warbler
<input type="checkbox"/> AMRE	American Redstart
<input type="checkbox"/> NOWA	Northern Waterthrush
<input type="checkbox"/> MGWA	MacGillivray's Warbler
<input type="checkbox"/> COYE	Common Yellowthroat
<input type="checkbox"/> WIWA	Wilson's Warbler
<input type="checkbox"/> ATSP	American Tree Sparrow
<input type="checkbox"/> CHSP	Chipping Sparrow
<input type="checkbox"/> SAVS	Savannah Sparrow
<input checked="" type="checkbox"/> FOSP	Fox Sparrow
<input type="checkbox"/> SOSP	Song Sparrow
<input type="checkbox"/> LISP	Lincoln's Sparrow
<input checked="" type="checkbox"/> GCSP	Golden-crowned Sparrow
<input type="checkbox"/> WCSP	White-crowned Sparrow
<input type="checkbox"/> SCJU	Slate-colored Junco
<input type="checkbox"/> ORJU	Oregon Junco
<input type="checkbox"/> DEJU	Dark-eyed Junco
<input type="checkbox"/> LALO	Lapland Longspur
<input type="checkbox"/> SNBU	Snow Bunting
<input type="checkbox"/> RUBL	Rusty Blackbird
<input type="checkbox"/> GCRF	Gray-crowned Rosy-Finch
<input checked="" type="checkbox"/> PIGR	Pine Grosbeak
<input type="checkbox"/> RECR	Red Crossbill
<input type="checkbox"/> WWCR	White-winged Crossbill
<input type="checkbox"/> CORE	Common Redpoll
<input type="checkbox"/> HORE	Hoary Redpoll
<input checked="" type="checkbox"/> PISI	Pine Siskin

<input type="checkbox"/> Shrew (sp.)
<input type="checkbox"/> Bat (sp.)
<input type="checkbox"/> Arctic fox
<input type="checkbox"/> Coyote
<input type="checkbox"/> Wolf
<input type="checkbox"/> Red fox
<input type="checkbox"/> Lynx
<input type="checkbox"/> River otter
<input type="checkbox"/> Wolverine
<input type="checkbox"/> Marten
<input type="checkbox"/> Fisher
<input type="checkbox"/> Ermine
<input type="checkbox"/> Least weasel
<input type="checkbox"/> Mink
<input type="checkbox"/> Black bear
<input type="checkbox"/> Brown bear
<input type="checkbox"/> Moose
<input type="checkbox"/> Mule deer
<input type="checkbox"/> Caribou
<input type="checkbox"/> Bison
<input type="checkbox"/> Mountain goat
<input type="checkbox"/> Muskox
<input type="checkbox"/> Dall's sheep
<input type="checkbox"/> Alaska marmot
<input type="checkbox"/> Hoary marmot
<input type="checkbox"/> Woodchuck
<input type="checkbox"/> Arctic ground squirrel
<input type="checkbox"/> Red squirrel
<input type="checkbox"/> Northern flying squirrel
<input type="checkbox"/> Beaver
<input type="checkbox"/> Jumping mouse (sp.)
<input type="checkbox"/> Red-backed vole (sp.)
<input type="checkbox"/> Collared lemming
<input type="checkbox"/> Brown lemming
<input type="checkbox"/> Microtus vole (sp.)
<input type="checkbox"/> Muskrat
<input type="checkbox"/> Northern bog lemming
<input type="checkbox"/> Deer mouse (sp.)
<input type="checkbox"/> Porcupine
<input type="checkbox"/> Collared pika
<input type="checkbox"/> Snowshoe hare
<input type="checkbox"/> Tundra hare

**MAMMAL EVIDENCE**

Visual observation  
 Tracks  
 Sign  
 Dam

**BREEDING BIRD EVIDENCE**

☒ Detected, no evidence of breeding  
☒ Observed in possible nesting habitat  
☐ Pair observed in suitable habitat  
☐ Singing male  
☐ Courtship display

☐ Building or excavating nest  
☐ Alarm call  
☐ Distraction display, injury-feigning  
☐ Nest observed  
☐ Downy or recently fledged young  
☐ Adult with fecal sac or food for young

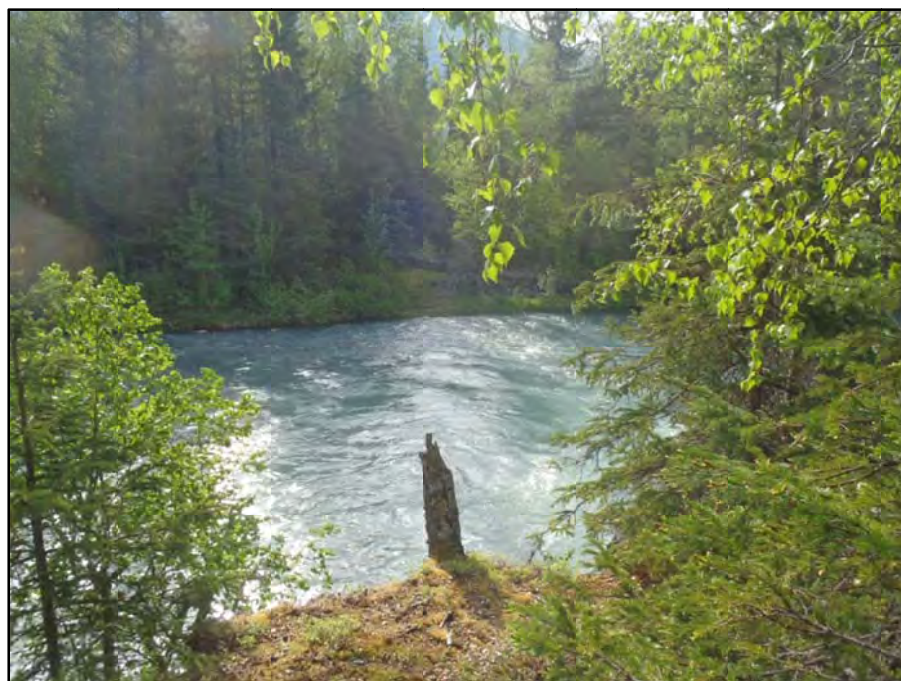




## Breeding Bird Point Vegetation Pictures



**Photo A.3a-1.** Point 1 Facing East.



**PhotoA.3a-2.** Point 2 Facing East.



**Photo A.3a-3.** Point 3 Facing East.



**PhotoA.3a-4.** Point 4 Facing East.





**Photo A.3a-5.** Point 5 Facing East.



**PhotoA.3a-6.** Point 6 Facing East.





**Photo A.3a-7.** Point 7 Facing East.



**PhotoA.3a-8.** Point 8 Facing East.





**Photo A.3a-9.** Point 9 Facing East.



**PhotoA.3a-10.** Point 10 Facing East.





**Photo A.3a-11.** Point 11 Facing East.



**PhotoA.3a-12.** Point 12 Facing East.



**Photo A.3a-13.** Point 13 Facing East.





**PhotoA.3a-14.** Point 14 Facing East.

## Appendix 3b. Northern Goshawk Data

July 8-9, 2013 Northern Goshawk Surveys

July 16-17, 2013 Northern Goshawk Surveys



LOCATION: GRANT LAKE		DATE: 8 JULY - 9 JULY 2013		OBSERVERS: ARA; RJB			ROUTE START Pt.: GH#6,5,9,4,3,2,1; GH#8,7,10,11,12,13,14,15		ROUTE END Pt.:		
ROUTE START TIME: 13:57; 0654		END TIME: 1634; 0949									
WEATHER CONDITIONS (i.e., temp, cloud cover, wind):											
Precipitation: LITE; NONE		% Cloud Cover: 100%; 80%		Air Temperature (F°): ~60°F; ~57°F				Wind (Beaufort): 2; 0			
Station Number:	Coordinates: ↓ DATA SHEET ON FILE.	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest- OSN; Goshawk nest with young -ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#6	1ST NOGO WAIL 2ND NOGO FLEDGING	1359	1404	Ø						VERY QUIET ON TREETH BIRDS  HOT!! MIDDAY.	
GH#5	1ST NOGO FLEDGING 2ND NOGO WAIL	1416	1421	Ø							
GH#9	1ST NOGO WAIL 2ND NOGO FLEDGING	1430	1435	Ø							
GH#4	1ST NOGO FLEDGING 2ND NOGO WAIL	1500	1505	Ø							

8 JULY INCIDENTALS: - WIWA 1 W NEST; TRBS W/ NEST; BABA W/ YOUNG [FEEDING]; HETH; CBCH; OCWA; SCJU; ARTE; PISI; PEDP; ME MURE; PGR.

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Station Number:	Coordinates: ↓ DATA SHEET ON FILE	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#3	1ST NOGO WAIL 2ND NOGO FLEDGING	1516	1522	⊙						HETH; SCOU;	~
GH#2	2ST NOGO FLEDGING 2ND NOGO WAIL	1538	1544	⊙						CBCH; HETH	~
GH#1	1ST NOGO WAIL 2ND NOGO FLEDGING	1629	1634	⊙						TRES; ABTP; HETH	~
END OF DAY											
9 JULY GH#8	1ST NOGO FLEDGING 2ND NOGO WAIL	0654	0658	⊙						VATH; HETH; PSI; WWCR; AMPO; MOGU	~
GH#7	1ST NOGO WAIL 2ND NOGO FLEDGING	0733	0737	⊙						PANR; VATH; HETH; WWCR;	~

Station Number:	Coordinates: ↓ DATA SHEET ON FILE	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#10	1ST NOGO FLEDGLING 2ND NOGO WAIL	0803	0807	Ø						HETH; PAWR;	
GH#11	1ST NOGO WAIL 2ND NOGO FLEDGLING	0822	0826	Ø						HETH; VATH;	
GH#12	1ST NOGO FLEDGLING 2ND NOGO WAIL	0848	0852	Ø						YRWA; HETH; VATH	
GH#13	1ST NOGO WAIL 2ND NOGO FLEDGLING	0909	0913	Ø						PIGR; HETH; FOSP; RCKI; WWA; WWCR; VATH; YWAR;	
GH#14	1ST NOGO FLEDGLING 2ND NOGO WAIL	0925	0929	Ø						YWAR; HETH; FOSP; SWTH; GRAN; VATH; SPSA;	



Station Number:	Coordinates: ↓	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
	ONSET ON FILE										
GH#15	1ST NOGO WHIL 2ND NOGO FLEDGING	0941	0945	①						AMDI; SWTH; VATH;	~

9 JULY INCIDENTALS: VATH; HETH; SWTH; PISI; REOP; AMRO; WWCN; MEGU; PAWR; AMDI; YRWA; WWCN; YWAR; FOSP; PIGR; RCKI; GRAT; SPSA;

### NOTE:

- \* THERE IS A LOT MORE BEAR SIGN IN THE FORM OF SCAT PILES (3).
- \* BAEA NEST @ MAIN CAMP; CHICK(S) APPEAR HATCHED OUT AS DETERMINED FROM ADULT FEEDING & BEHAVIOR.
- \* MERL ^ ARE DEFENDING "NEST" AREA FROM BAEA. HATCHED YOUNG NOT VERIFIED, BUT NEST IS SOMEWHERE ON IS. BELOW "NARROWS" ACROSS FROM PRIVATE PROPERTY.
- \* VEG. WAS VERY DEVELOPED & DIFFICULT TO TRAVERS - TOOK 1/3 LONGER TO RUN 9 JULY POINTS.

## NORTHERN GOSHAWK BROADCAST SURVEY

LOCATION: <u>GRANT LAKE</u>		DATE: <u>16 &amp; 17 JUNE 2013</u>		OBSERVERS: <u>ARA, RJB</u>		ROUTE START Pt.: <u>GH#1, 2, 3</u>		ROUTE END Pt.: <u>4, 9, 5, 6 / GH#8; 7; 10, 11, 12, 13, 14, 15</u>			
ROUTE START TIME: <u>0900 ; 0458</u>		END TIME: <u>1323 ; 0824</u>									
WEATHER CONDITIONS (i.e., temp, cloud cover, wind):											
Precipitation:		% Cloud Cover:			Air Temperature (F°):			Wind (Beaufort):			
Station Number:	Coordinates:	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#1	16 JUNE 2013 <u>ONCE ONLY</u> #1 & #2 - NOGO 2 NOTE WAIL #3 - NOGO BEGGING CALL S-Ø; W-Ø Temp=52°F	0900	0902	Ø						WBN RCK1, OCWA, HED, VTH	
GH#2	#1 & #2 - NOGO 2 NOTE WAIL #3 - NOGO BEGGING CALL  <u>ONCE ONLY</u>	1028	1030	Ø						RCK1, OCWA,	
GH#3	1ST ROUND NOGO - 2 NOTE WAIL 2ND ROUND NOGO - BEGGING CALL	1124	1128	Ø						OCWA,	
GH#4	1ST ROUND NOGO - BEGGING CALL 2ND ROUND NOGO - 2 NOTE WAIL	1213	1219	Ø						OCWA, AMRO, BREA	



Station Number:	Coordinates:	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#9	1ST ROUND NOGO - WAIL CALL # NOGO - DETECTION	1228	1241	1240	2 MIN	20°	20M	BGOS VISUAL FOLLOWER DURING WAIL CALL, THEN VOCALIZED!	ADULT ♀ LARGE	NONE -  RCKI; OCWA; AMRO; YRWA; BETH LOOK TO BBS PT#6L#9	POSITIVE 100%
GH#5	1ST ROUND NOGO - WAIL CALL 2ND ROUND NOGO - BEGGING CALL  TEMP = 68°F S-O W-O	1258	1302	⊙						OCWA; WIWA; TOWA HETH;	
GH#6	1ST ROUND NOGO - BEGGING CALL 2ND ROUND NOGO - WAIL CALL	1319	1323	⊙						YRWA; OCWA; RCKI	
GH#8	17 JUNE 2013 S-O; W-O; S-O 1ST ROUND - WAIL CALL 2ND ROUND - BEGGING CALL	0458	0504	⊙						HETH; WIWA; TOWA; AMRO; LISP; VATH; NOWA; YRWA;	
GH#7	1ST ROUND - BEGGING CALL 2ND ROUND - WAIL CALL	0531	0536	⊙						HETH; RCKI; TOWA; SGO; COLD; AMRO; VATH	



Station Number:	Coordinates:	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
GH#10	1st ROUND - WAIL CALL 2nd ROUND - BEGGING CALL	0601	0607	⊙						VATH; OCWA; HETH;	
GH#11	1st ROUND - BEGGING CALL 2nd ROUND - WAIL CALL	0625	0630	⊙						PANR; OCWA; VATH; TDWA; HETH YRWA	
GH#12	1st ROUND - WAIL CALL 2nd ROUND - BEGGING CALL	0654	0659	⊙						VATH; OCWA; HETH	
GH#13	1st ROUND - BEGGING CALL 2nd ROUND - WAIL CALL	0720	0726	⊙						HETH; YRWA; WIWA; FOEP; YWAR; RCKI; OCWA; COLO;	
GH#14	1st ROUND WAIL CALL 2nd ROUND - BEGGING CALL	0740	0746	⊙						COLO; GOWENEVER YRWA; TDWA; YWAR; VATH; SCJU; OCWA; HETH.	



Station Number:	Coordinates:	Start Time:	Stop Time:	Time of Response:	Time Elapsed Since First Broadcast:	Estimated Bearing to Response:	Estimated Distance to Response:	Description of Detection: Silent visual detection - SGOS; Vocal detection - VGOS; Vocal and visual detection - BGOS; Inactive goshawk stick nest - OSN; Goshawk nest with young - ANY; Nest with young fledged - ANF	Age of Birds Detected: Adult (A); Juvenile (J); Nestling (N); Age Unknown (U)	Notes: (include Photo #'s if taken; Detection of possible goshawk prey remains; Other species detected in between survey stations; General habitat description):	Comments (e.g., observer confidence in species classification, distance and bearing, etc.):
# GH15	1ST ROUND - BEGGING CALL 2ND ROUND - WAIL CALL S-D-W-D-T=58°F	0818	0824	Ø						GOLDEN EYE 2♂ + 1♀ OWA; HOTH	

[illegible]

## Appendix 3c. Wildlife Related Materials

### Table A.3c-1. Plant Species and Codes

### Wildlife Fieldnotes





**Table A.3c-1.** Plant species and codes.

<b>Tree Codes</b>	<b>Common Name</b>	<b>Scientific Name</b>
PICGLA	White Spruce	<i>Picea glauca</i>
PICLUT	Lutz Spruce	<i>Picea x lutzii</i>
PICMAR	Black Spruce	<i>Picea mariana</i>
PICSIT	Sitka Spruce	<i>Picea sitchensis</i>
TSUMER	Mountain Hemlock	<i>Tsuga mertensiana</i>
POPBAL	Cottonwood	<i>Populus balsamifera</i>
BETPAP	Birch	<i>Betula papyrifera</i>
<b>Shrub Codes</b>	<b>Common Name</b>	<b>Scientific Name</b>
ALNSPP	Alder Species	<i>Alnus sp.</i>
ALNVIR	Sitka Alder	<i>Alnus viridis ssp. Sinuata</i>
ANDPOL	Dwarf Bog-rosemary	<i>Andromeda polifolia</i>
BETGLA	Dwarf Birch	<i>Betula glandulifera</i>
BETNAN	Bog Birch	<i>Betula nana</i>
CORCAN	Dwarf Dogwood	<i>Cornus canadensis</i>
EMPNIG	Mossberry	<i>Empetrum nigrum</i>
LEDDEC	Narrow-leaf Labrador Tea	<i>Ledum decumbens</i>
LEDGRO	Labrador Tea	<i>Ledum groenlandicum</i>
LEDSP	Labrador Tea Species	<i>Ledum sp.</i>
LINBOR	Twinflower	<i>Linnaea borealis</i>
MENFER	False Azalea	<i>Menziesia ferruginea</i>
OPLHOR	Devil's Club	<i>Oplopanax horridus</i>
RIBTRI	Wild Red Current	<i>Ribes triste</i>
ROSACI	Prickly Rose	<i>Rosa acicularis</i>
RUBARC	Nagoonberry	<i>Rubus arcticus</i>
RUBCHA	Cloudberry	<i>Rubus chamaemorus</i>
RUBPED	Five-leaved Bramble	<i>Rubus pedatus</i>
SALALA	Felt-leaf Willow	<i>Salix alaxensis</i>
SALSPP	Willow Species	<i>Salix sp.</i>
SALSTI	Sitka Willow	<i>Salix stichensis</i>
SHECAN	Soapberry	<i>Shepherdia canadensis</i>
SPIBEA	Steven's Spirea	<i>Spiraea beauverdana</i>
VACALA	Alaska Huckleberry	<i>Vaccinium alaskensis</i>
VACOVA	Tall (early) Blueberry	<i>Vaccinium ovalifolium</i>
VACVIT	Lingonberry	<i>Vaccinium vitis-idaea</i>
VIBEDU	High-bush Cranberry	<i>Viburnum edule</i>

Table A.3c-1, continued...

Herbaceous Codes	Common Name	Scientific Name
ANERIC	Yellow Anemone	<i>Anemone richardsonii</i>
CALCAN	Bluejoint	<i>Calamagrostis canadensis</i>
CHAANG	Fireweed	<i>Chamerion angustifolium</i>
CHALAT	River Beauty	<i>Chamerion latifolium</i>
COMPAL	Marsh Cinquefoil	<i>Comarum palustre</i>
DRYOCT	Eight-petaled Dryas	<i>Dryas octopetala</i>
EQUARV	Common Horsetail	<i>Equisetum arvense</i>
EQUSP	Horsetail Species	<i>Equisetum sp.</i>
GALTRI	Small Bedstraw	<i>Galium trifidum</i>
GEOLIV	Bastard Toad-flax	<i>Geocaulon lividum</i>
GERERI	Northern Geranium	<i>Geranium erianthum</i>
HERLAN	Cow Parsnip	<i>Heracleum lanatum</i>
LUPSP	Lupine Species	<i>Lupinus sp.</i>
PYRASA	Pink Wintergreen	<i>Pyrola asarifolia</i>
STRAMP	Clasping Twistedstalk	<i>Streptopus amplexifolius</i>
TRIARC	Northern Starflower	<i>Trientalis arctica</i>
VIOLAN	Alaska Violet	<i>Viola langsдорфii</i>
VIOSPP	Violet Species	<i>Viola sp.</i>
Fern Codes	Common Name	Scientific Name
DRYEXP	Wood Fern	<i>Dryopteris expansa</i>
GYMDRY	Oak Fern	<i>Gymnocarpium dryopteris</i>
Lichen Codes	Common Name	Scientific Name
CLASPP	Reindeer Lichen Species	<i>Cladina sp.</i>
PELBRI	Freckle Pelt	<i>Peltigera britannica</i>
Moss Codes	Common Name	Scientific Name
HYLSPL	Step Moss	<i>Hylocomium splendens</i>
PLESCH	Red-stemmed Feathermoss	<i>Pleurozium schreberi</i>

### **Field Notes for July 8-9 Northern Goshawk Surveys:**

The second Northern Goshawk survey was completed July 9, 2013. A total of 15 points were surveyed using the methods described in the study plan.

**Logistics:** Mark Miller helped with shuttling Amal and Bobby across the river. Amal and Bobby were based a short distance out of the man-camp.

**Monday:** Travel, set up camp, and surveyed goshawk points: 1, 2, 3, 4, 9, 5 and 6.

**Tuesday:** surveyed goshawk points: 7, 8, 10, 11, 12, 13, 14 and 15. Traveled back to Anchorage / Fairbanks.

**Field data:** The forms have been uploaded into SharePoint along with notes.

**Bald Eagle Nest:** Eagles are currently feeding hatched young as assessed from their behaviour.

**Merlins:** The pair are currently still in the area and actively defending a “nest” territory as assessed from their behaviour.

The survey was completed. The vegetation was not difficult on Monday, but was very difficult on Tuesday further in towards the lake. It took 1/3 longer to do the last 8 points. The Devil’s club and False Azalea impede travel, the fern are so developed you can’t see the ground for sure footing, and the humidity is up making rocks and branches very slick. The survey was more challenging, but doable especially because we broke it down into “2” days rather than one long one.

**Incidental list:** Varied Thrush; Ruby-crowned Kinglet; Yellow-rumped Warbler; American Dipper; Bald Eagle; Chestnut-backed Chickadee; Merlin; Mew Gull; Swainson’s Thrush; Hermit Thrush; Slate-colored Junco; Orange-crowned Warbler; Spotted Sandpiper; Tree Swallow; Gray Jay; Yellow Warbler; Wilson’s Warbler; Arctic Tern; Pine Siskin; Redpoll; Pine Grosbeak; White-winged Crossbill; Fox Sparrow; Pacific Wren.

There was more, fresher bear sign in the form of scat (3).



## Field Notes for May 21-22 Breeding Bird Surveys:

The first field survey of Breeding birds went well. I flew down to Anchorage on Monday 20 May, Bobby Beckmen picked me up and we set out for Moose Pass. I contacted John Stevenson along the way to let him know we were coming and we all converged at the house in Moose Pass. John took us out across the Narrows in the boat and we made camp on the south side of the creek. We decided to find a few points and get an idea of the habitat and terrain. Tuesday morning we surveyed points: 7, 8, 10, 11, 12, 13, 14. Wednesday we surveyed points: 9, 6, 5, 4, 3, 2, 1. The crossing in the canoe was uneventful and easy. We completed surveys for all 14 points. The weather was very agreeable. The forms will be uploaded into SharePoint by the end of the day, along with notes, the few picture we took and incidental information. We took coordinates for the Bald Eagle nest at the camp sight. They are currently incubating eggs from their behaviour. Bobby and I were curious about a pair of Merlin in the immediate area, so we found them and took coordinates of a suspected nest sight, however, I do not believe they are incubating yet (based on their behaviour).

### NAD83

60.45676; 149.36002 Bald Eagle Nest (Incubating)

60.45599; 149.36365 Suspected Merlin Nest site.

We decided **NOT** to take the Vegetation information this time around as most of the plants were senesced and very difficult to ID. We will accomplish that in June when the vegetation is in a better state (leaves and flowers).

I will be honest and say that we had it easy this time around. I feel we will have more complications once the vegetation grows up, it will make traveling slower, more difficult and more painful. I got slapped with a Devils club (not bad, but certainly could do without), and foresee a lot more of that in June and July. I am hoping this will not affect my assessment of travel time and survey time. We will try to keep up the pace.

I have included some pictures for your view. Grant lake is still very much iced over. However, the snow has pretty much receded from the whole survey area, with only small pockets here and there. The birds were singing, but there was a marked lack of certain species, especially the insectivores. I suspect that they will be arriving soon and our June surveys will pick them up.

**Our incidental list:** Varied Thrush; Ruby-crowned Kinglet; Yellow-rumped Warbler; American Dipper; Bald Eagle; Chestnut-backed Chickadee; Black-capped Chickadee; Boreal Chickadee; Merlin; Mew Gull; Brown Creeper; Hermit Thrush; Loon Species (either Pacific or Common, was very bad lighting and couldn't tell); Slate-colored Junco; Orange-crowned Warbler; Belted Kingfisher; Greater Yellowlegs; Golden-crowned Sparrow; Spruce Grouse; Harlequin Ducks. There was Moose sign everywhere. The crews reported seeing a moose the day before we arrived. There was NO bear sign.

## **Field Notes for June 14-17 Breeding Bird & Northern Goshawk Surveys:**

The second and final songbird survey was completed June 16, 2013. A total of 14 points were surveyed using the methods described in the study plan.

**Logistics:** John Stevenson helped with shuttling Amal and Bobby across the river. Amal and Bobby were based a short distance out of the man-camp.

**Friday:** Travel, obtained waders and rope from Seward, shuttle across the river, set up camp, tested safety of weir, visual inspection of water levels

**Saturday:** surveyed breeding bird points: 7, 8, 10, 11, 12, 13, and 14. Vegetation survey of points: 7, 8, 10, 11, 12, 13, 14, 9 and 6.

**Sunday:** surveyed breeding bird points: 9, 6, 5, 4, 3, 2, 1. Vegetation survey of points: 5, 4, 3, 2, and 1. Surveyed goshawk points: 1, 2, 3, 4, 9, 5 and 6.

**Monday:** surveyed goshawk points: 7, 8, 10, 11, 12, 13, 14 and 15.

**Field data:** The forms have been uploaded into SharePoint along with notes, the few picture we took and incidental information.

**Bald Eagle Nest:** Eagles are currently incubating eggs as assessed from their behaviour.

**Merlins:** The pair are currently still in the area and suspected to be incubating eggs.

All surveys were completed. The Breeding Bird surveys are now finished. The last 2013 Goshawk survey is scheduled for July 8-10. I have included some pictures, for your view. Grant Lake is now ice free, and the snow only remains in the highest elevations. All expected birds were singing, and we documented a Red-breasted Merganser hen with 10 downy chicks (roughly 1-7 days old).

**Incidental list:** Varied Thrush; Ruby-crowned Kinglet; Yellow-rumped Warbler; American Dipper; Bald Eagle; Chestnut-backed Chickadee; Boreal Chickadee; Merlin; Glaucous-winged Gull; Brown Creeper; Hermit Thrush; Common Loon; Slate-colored Junco; Orange-crowned Warbler; Belted Kingfisher; Spotted Sandpiper; Golden-crowned Sparrow; Harlequin Ducks; Violet-green Swallow; Common Raven; Wilson's Snipe; Alder Flycatcher; Osprey; Pacific Wren.

A cow moose and calf came through our camp one night, but left without incident. There was moose sign everywhere along our survey routes. There was bear sign in the form of scat.

