

Terrestrial Resources Presentation For the Grant Lake Hydroelectric Project

Grant Lake Hydroelectric Project (FERC No. 13212)
Natural Resource Studies Meeting
March 18, 2014– Anchorage, AK



In Association with



Owner



MIKE SALZETTI
(907) 283-2375
msalzetti@homerelectric.com

Project Manager

CORY WARNOCK (MCM)
(360) 384-2662
cwarnock@longviewassociates.com



Botanical Resources Studies

- General vegetation type mapping (Beck Botanical Services)
- Sensitive plant and invasive plant survey (Beck Botanical Services)
- Mapping wetlands and other waters of the U.S. (ERM)

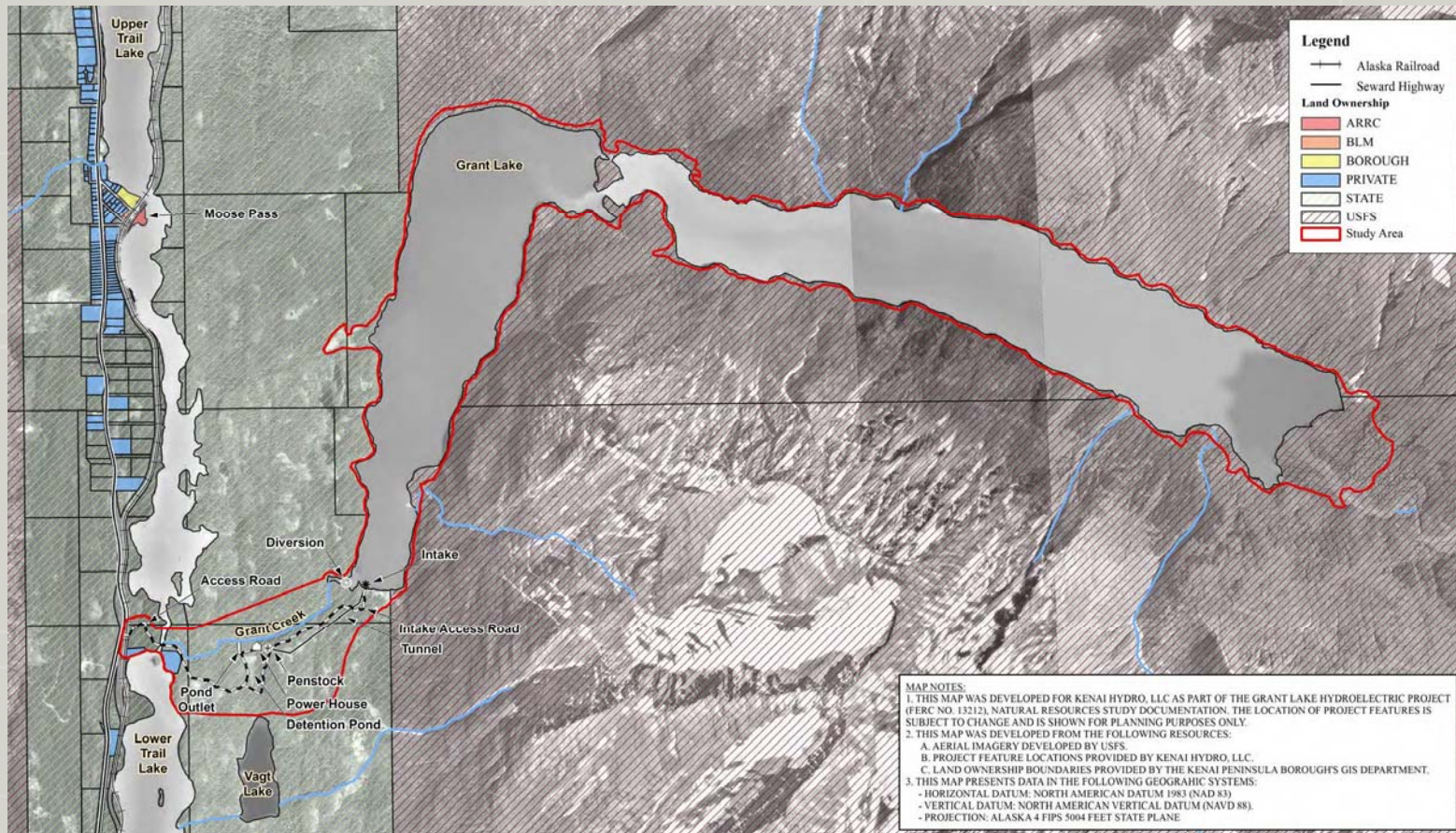
Wildlife Resources Studies

- Raptor nesting surveys
- Breeding landbirds and shorebirds
- Waterbirds
- Terrestrial mammal surveys

Field Study Timeline

[illegible]

Combined Terrestrial Assessment Area



Terrestrial Vegetation: Grant Lake Project

- General Vegetation Type Survey
- Invasive Plant Survey
- Sensitive Plant Survey



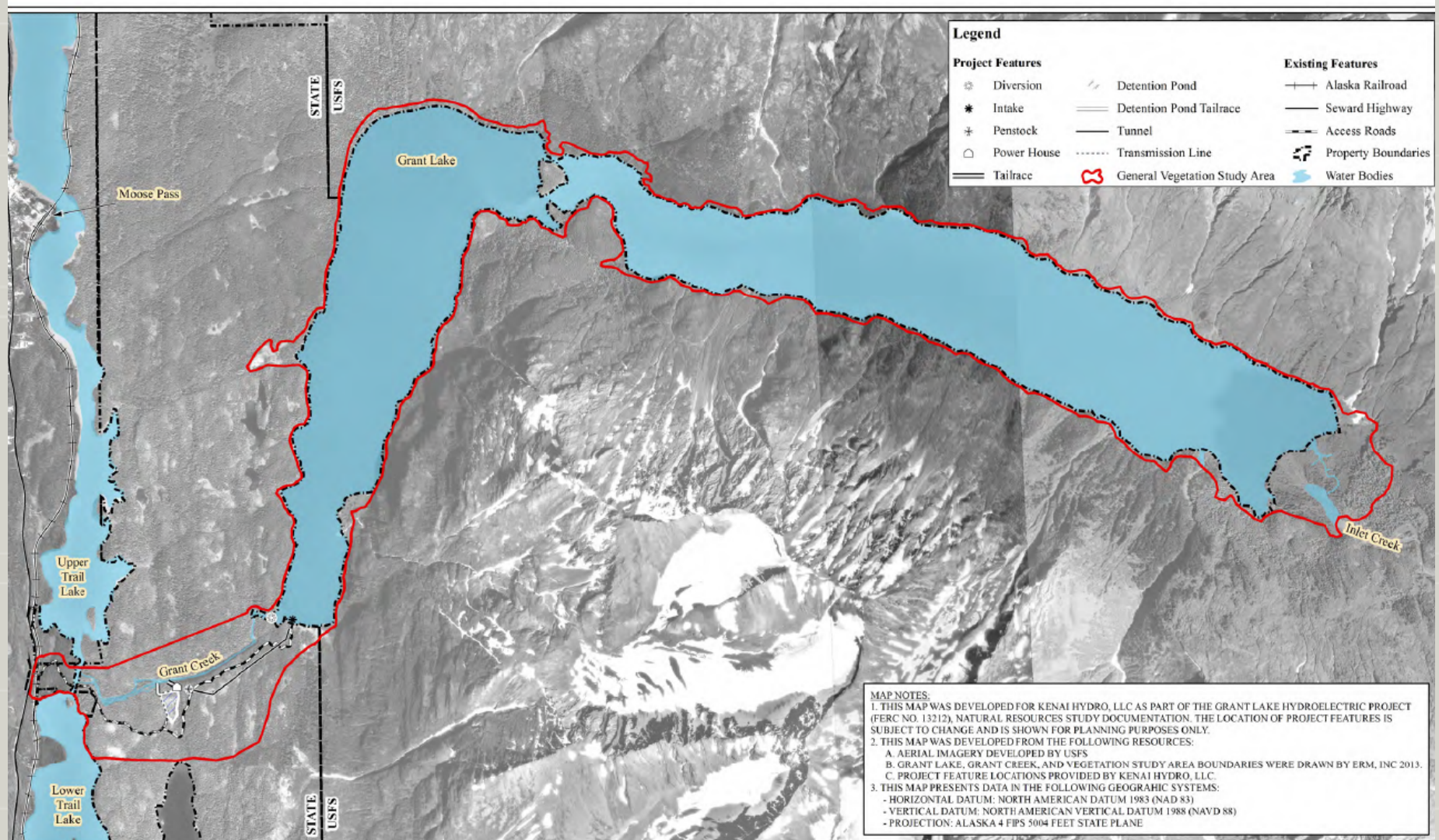
General Vegetation Type Objectives

- Vegetation Type Mapping
 - Refine existing vegetation type map of the Project vicinity using existing GIS layers, aerial photography, and available satellite imagery
 - Produce a technical report with a description of Project vegetation

General Vegetation – Existing Information

- Sets of aerial photograph imagery of the general area dating from between 1996 and 2004 was available from the USFS.

General Vegetation Type Study Area (red line)



General Vegetation Type Survey Methods

- A combination of field observations, ground truthing, and aerial photo interpretation was used to update vegetation type polygon boundaries
- The resulting vegetation type map was used to calculate total acres and percentages of each vegetation type present
- Only upland vegetation types were mapped – wetland veg is covered in a later presentation

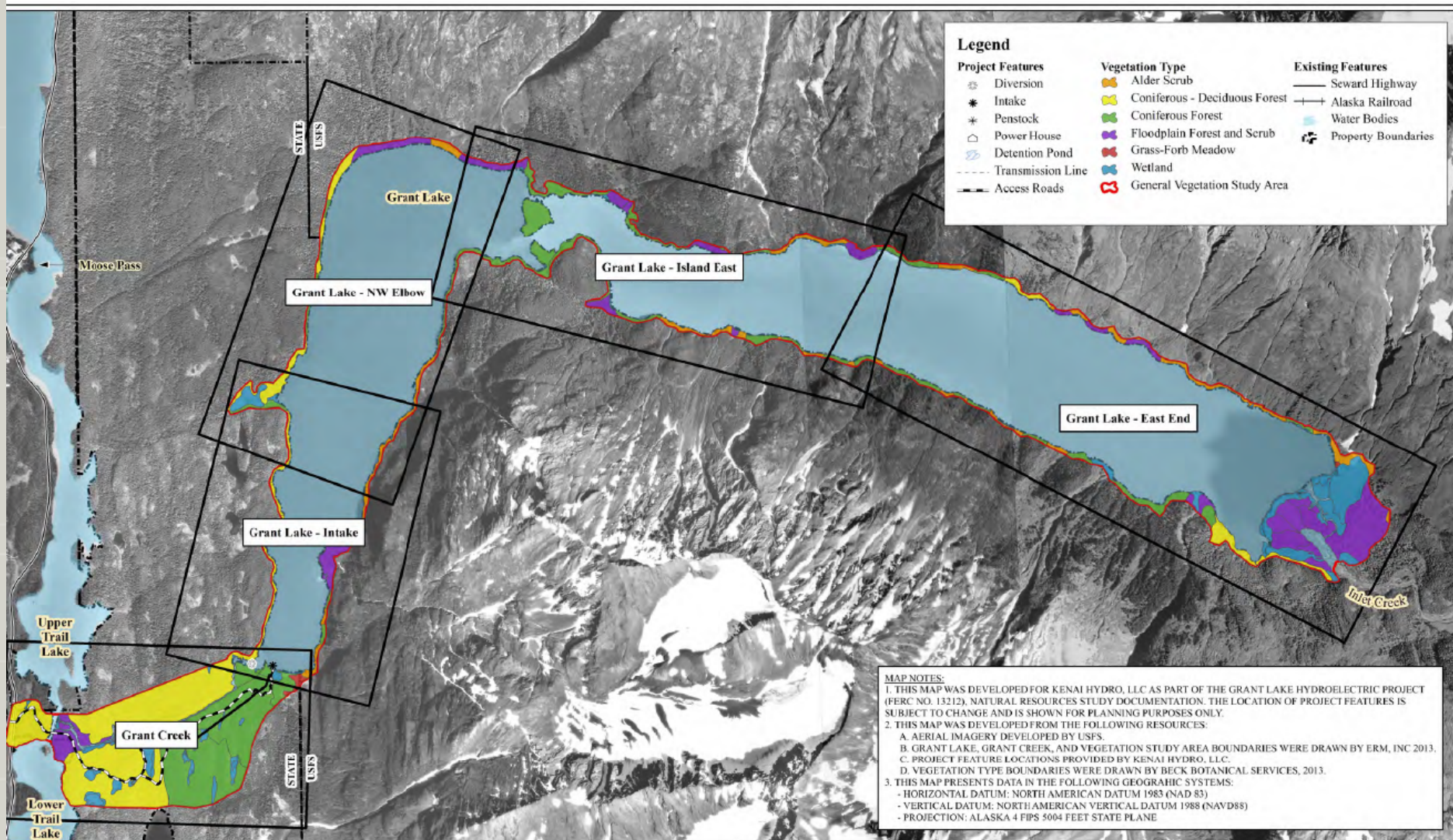
General Vegetation Survey Results

- Total of 570.5 acres in study area
- 5 upland vegetation types were mapped:
 - Coniferous Forest
 - Coniferous-Deciduous Forest
 - Floodplain Forest and Scrub
 - Grass-Forb Meadow
 - Alder Scrub
- These vegetation types are all common in Alaska

General Vegetation Types, Acres, and Percentages

Vegetation Type	Acres	Per- cent	NatureServe Ecological System
Coniferous Forest	173.7	30.5%	Alaska Sub-boreal White-Lutz Spruce Forest and Woodland, Alaskan Pacific Maritime Mountain Hemlock Forest, Alaska Sub-boreal Mountain Hemlock-White Spruce Forest
Coniferous-Deciduous Forest	177.1	31.0%	Alaska Sub-boreal White Spruce-Hardwood Forest
Alder Scrub	34.5	6.0%	Alaska Sub-boreal Avalanche Slope Shrubland
Grass-Forb Meadow	2.2	0.4%	Western North American Sub-boreal Mesic Bluejoint Meadow
Floodplain Forest and Scrub	106.0	18.6%	Western North American Boreal Montane Floodplain Forest and Shrubland
Wetlands	77.1	13.5%	Wetland Vegetation types
Total	570.5	100%	

General Upland Vegetation Types



Grant Lake Vegetation Types



Coniferous Forest



Coniferous-Deciduous Forest



Floodplain Forest and Scrub



Grass-Forb Meadow



Alder Scrub



General Vegetation: Potential Qualitative Construction (Short Term) Impacts

- Potential Direct Impacts: Vegetation clearing, soil disturbance, altered natural grade, fill material placement, damage by machinery
- Potential Indirect Impacts: Invasive plant infestation; soil erosion; poor native vegetation reestablishment; change of light or moisture levels; shift to earlier successional vegetation types.

General Vegetation: Potential Qualitative Operational (Long Term) Impacts

- Potential Direct Impacts: Loss of natural vegetation; Grant Creek flow regime changes; Grant Lake inundation, water level fluctuations, and drawdowns.
- Potential Indirect Impacts: Invasive plant infestation; alteration and/or loss of upland veg types; effects of new Grant Creek flow regime; effects of new Grant Lake level fluctuation regime.



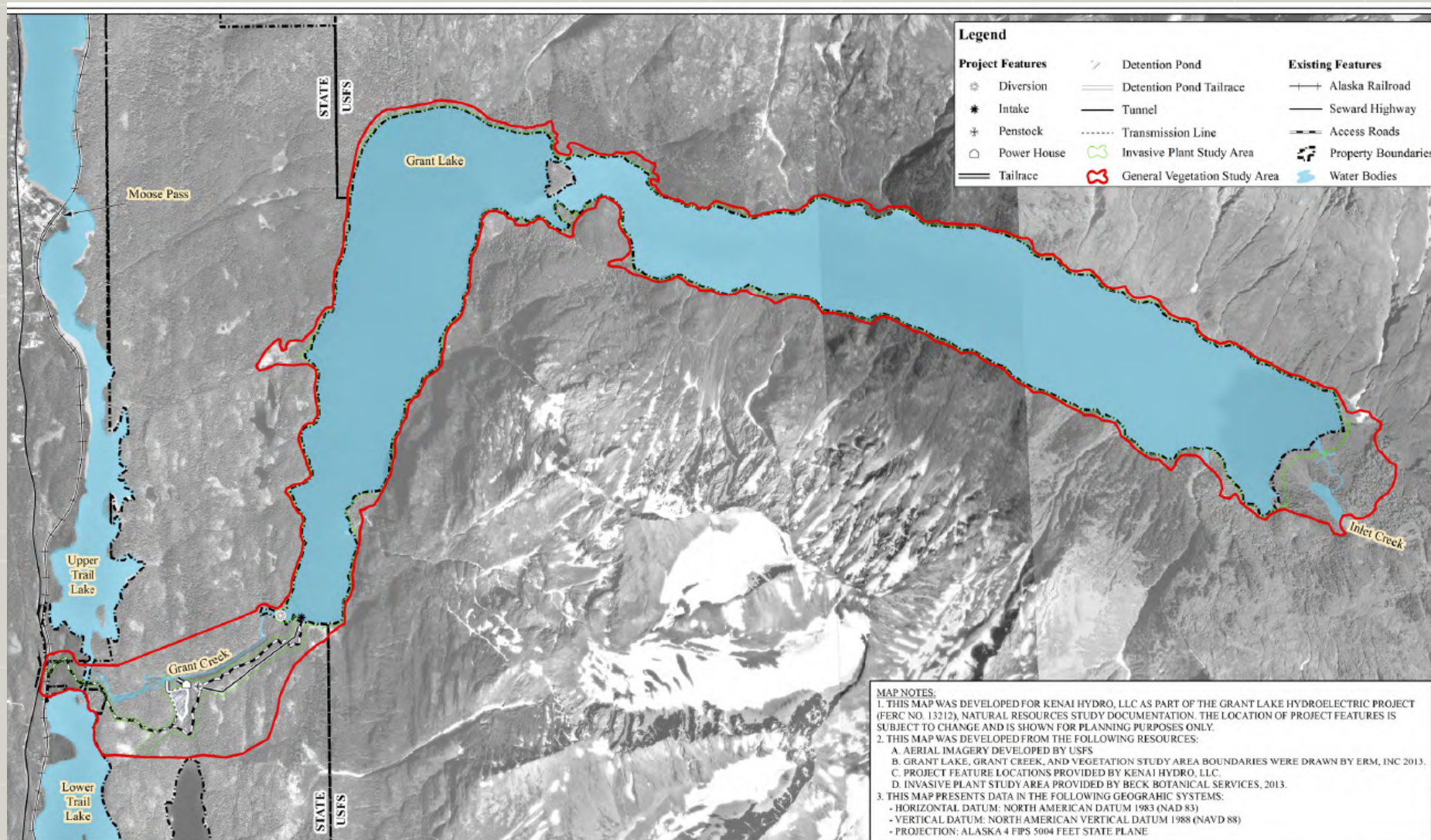
Invasive Plant Survey Objectives

- Locate and document populations of invasive plants in areas potentially affected by Project construction and operation
- Produce a technical report

Invasive Plant Survey – Existing Information

- The NRIS (Natural Resource Information System) database has documentations of multiple populations of 7 invasive plant species within ¼ mile of the study area.
- Most of these populations are located along the Seward Highway, Alaska Railroad, and the area between Upper Trail and Lower Trail lakes.

Invasive Plant Study Area (green line)



Invasive Plant Survey Methods

- Focus surveys in likely potential habitats for invasive plants (roadsides, trails, human use areas, etc.)
- Document invasive plants with AKEPIC (Alaska Exotic Plant Info Clearinghouse) forms
- Keep records of survey locations
- Take GPS points, as necessary

Invasive Plant Survey Results

- Overall, few populations of invasive plants were documented in the Invasive Plant Study area.
- Populations were relatively small.
- Invasive species included: common dandelion, white clover, Kentucky bluegrass, and annual bluegrass.
- These 4 species have been documented in the larger area.
- Almost all of these were associated with human disturbance areas like the Seward Highway, Alaska Railroad ROWS, the Grant Lake Trail, and other developments.

Invasive Plants: Potential Project Impacts

- Invasive plant populations in the Project area could become larger;
- Invasive plant populations could spread to new areas within the Project area;
- New species of invasive plants could spread to areas affected by the Project; and
- Invasive plant populations could spread out of the Project area into adjacent areas.
- An Invasive Plant Management Plan with BMPs will be developed to minimize invasive plant impacts.



Sensitive Plant Survey Objectives

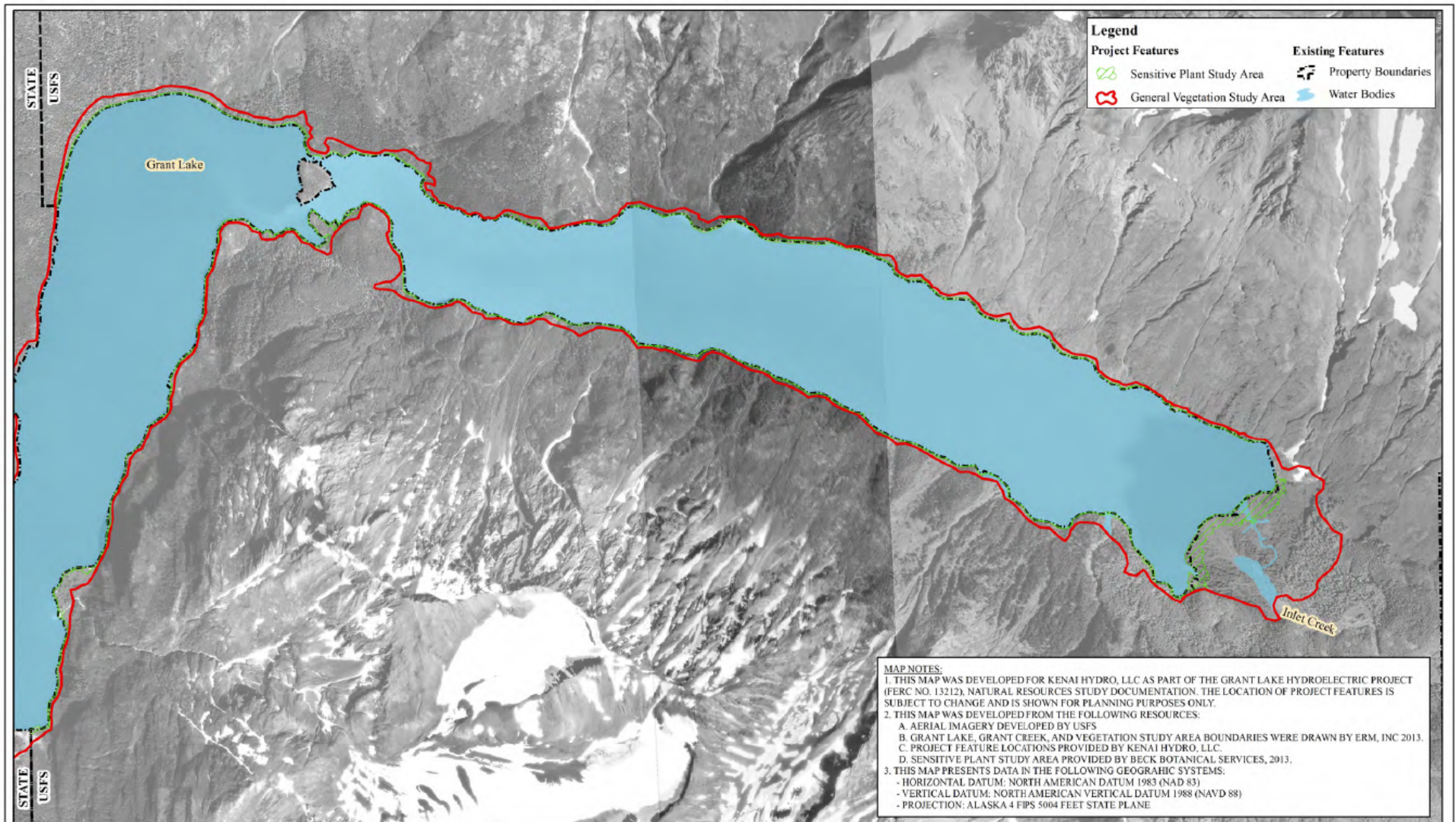
- Satisfy Forest Service requirements for a Biological Evaluation (BE) of plants on its lands



Sensitive Plant Survey: Previous Efforts

- No sensitive plant survey work had been done in the Project area previous to 2013.
- A data search revealed no known populations of Sensitive plants in the Project area.

Sensitive Plant Study Area (green line)



Sensitive Plant Survey Methods

- Follow USFS procedures for Sensitive Plant Surveys (Stensvold 2002)
- Focus surveys in high potential habitats
- Use Level 5 (Intuitive Controlled) intensity survey
- Complete TES Plant Element Occurrence Forms
- Complete the USFS Plant Survey Field Form
- Keep records of survey locations
- Record all vascular plant species observed
- Take GPS points, as necessary

Sensitive Plant Survey Results

- A small population of the USFS Sensitive plant species pale poppy (*Papaver alboroseum*) was located on USFS land on the north side of Grant Lake
- 15 plants were located
- It was estimated that the population was located between 701 and 705 feet (normal maximum lake elevation is 703 feet)
- The habitat was sparsely vegetated, cobble, sand, and gravel on a south-facing creek outwash

Pale Poppy (*Papaver alboroseum*)



Pale Poppy Flower



Pale Poppy Habitat



Potential Impacts to Sensitive Plants

Project effects could cause potential qualitative impacts to the pale poppy population or other undetected sensitive plant populations on USFS lands.

- Project Effects: Shoreline inundation, drawdowns, and lake water level fluctuations
- Potential Direct Impacts: Inundation of plants and loss of suitable habitat
- Potential Indirect Impacts: Spread of invasive plants; light or moisture changes

Next Steps:

- Draft Biological Evaluation for Plants
 - Assess potential Project impacts and PME's for Sensitive Plants
 - Develop Sensitive Plant Management Plan
- Draft Invasive Plant Management Plan
 - Assess potential Project impacts with regard to invasive plants
 - Develop construction BMP's
 - Include in the Draft License Application

Questions?



Wetlands and Waters of the U.S. Studies

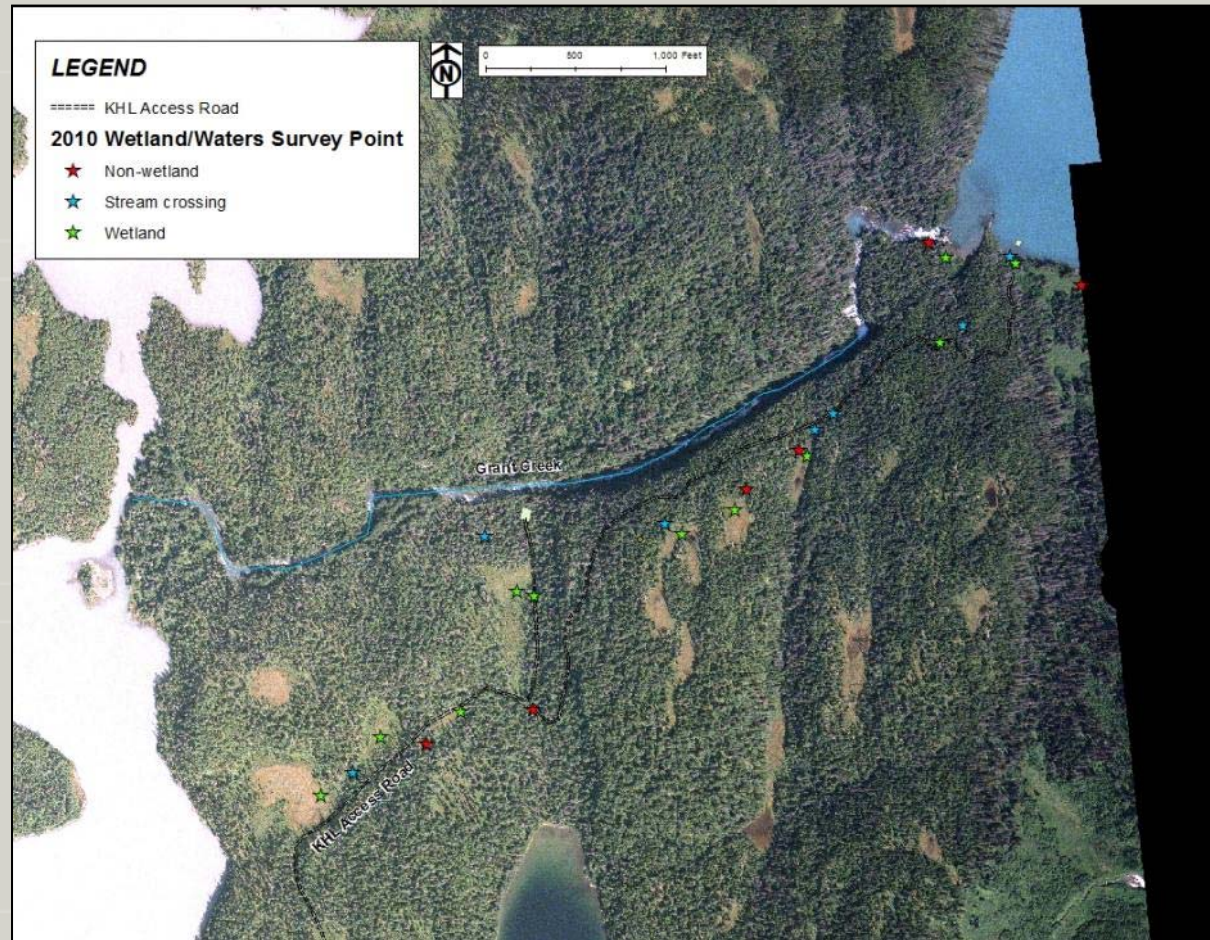
Goal: Identify and describe the wetlands and waters potentially affected by the Project

- Wetlands mapping and classification
- Functional assessment



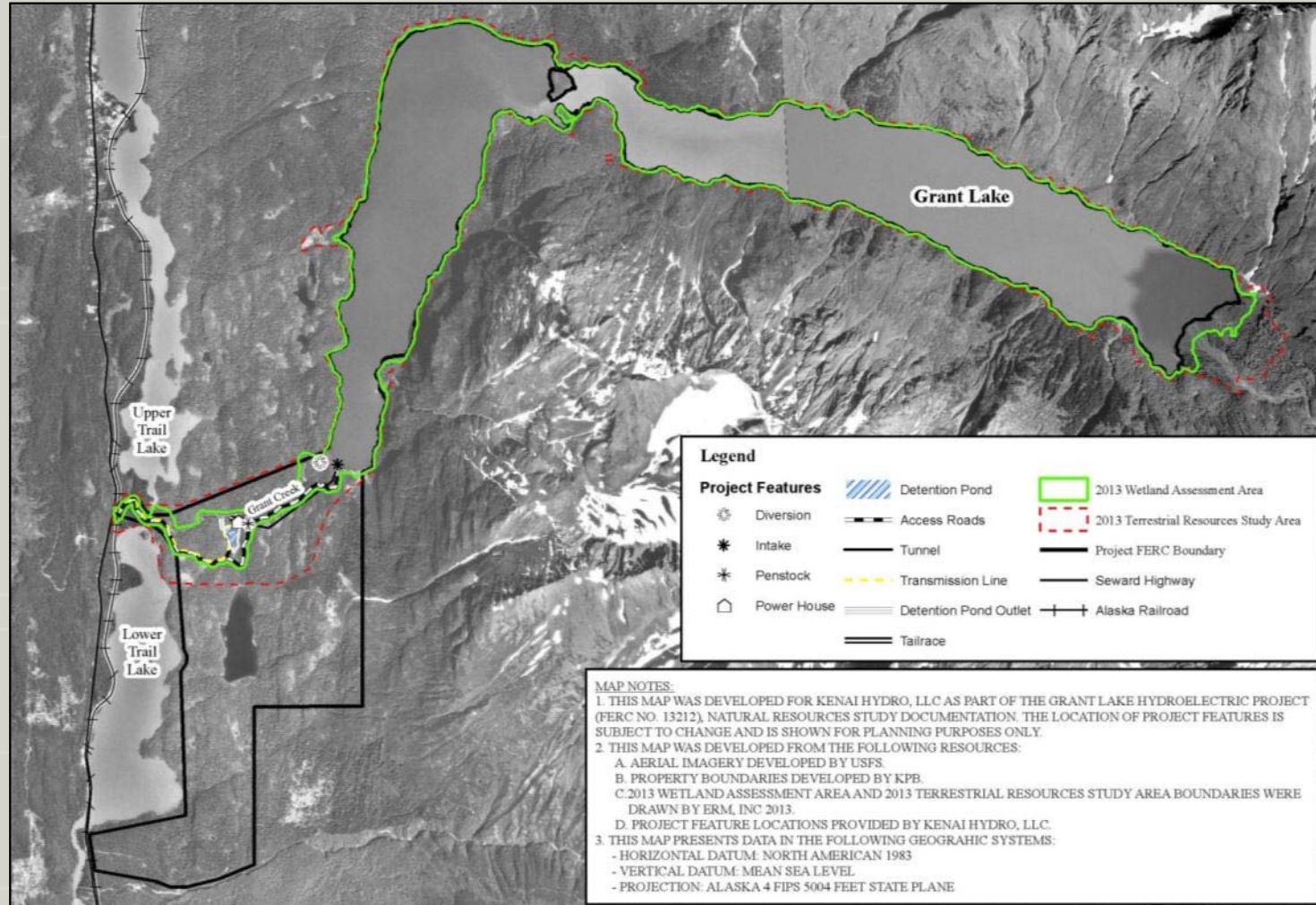
2010 Work

- Field sampled 43 points within transmission corridor



2013 Work

Wetlands and Waters Assessment Area



2013 Work: Methods Overview

- Wetland Mapping
 - Pre-mapping in GIS
 - Field-based wetland determination and mapping
 - Final wetland mapping in GIS
- Wetland Functional Assessment
 - Develop assessment method
 - Field-based assessment
 - Complete functional assessment
- Wetlands and Waters Report
- Wetlands and waters geodatabase

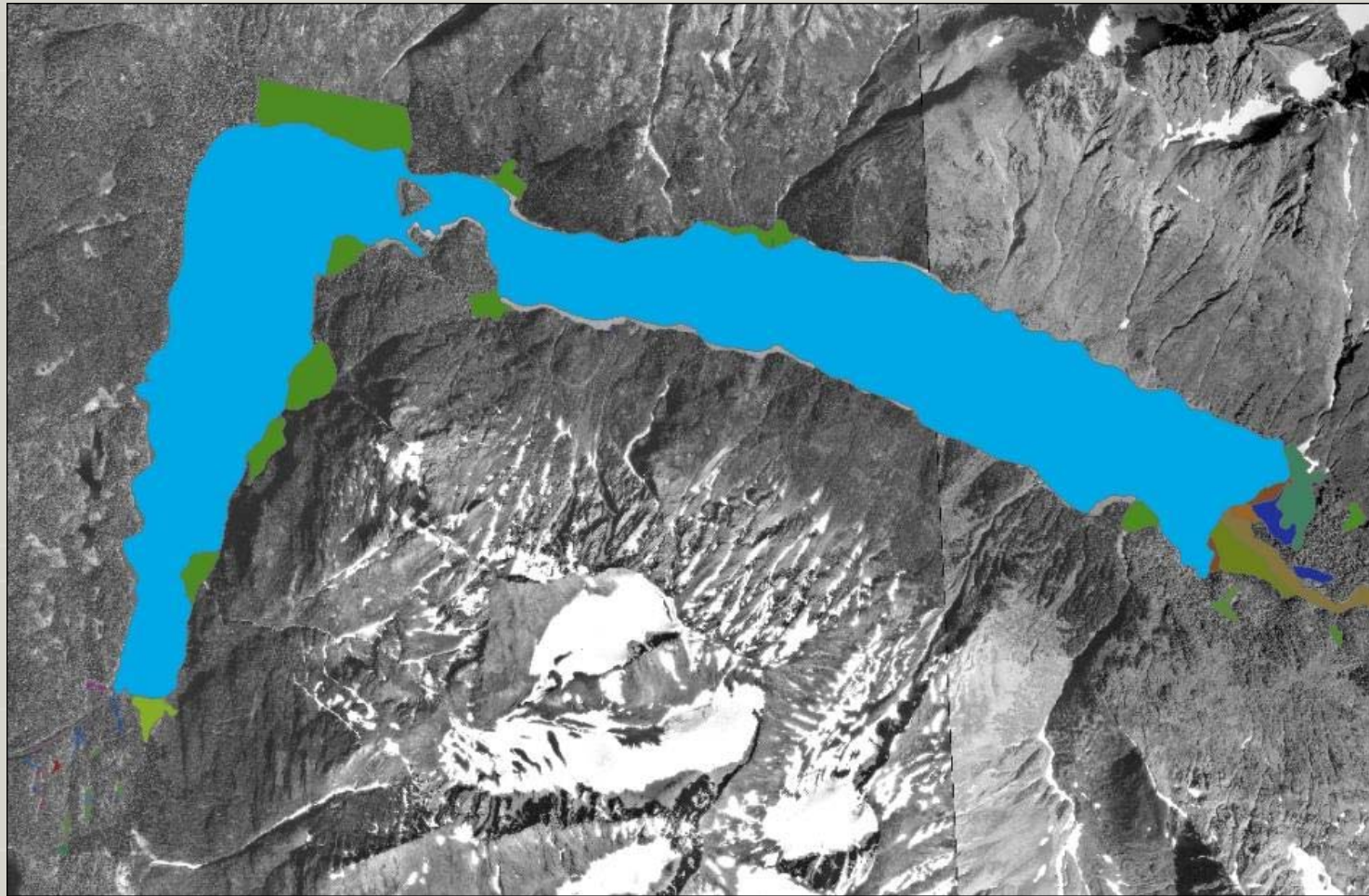
Methods

Wetlands Pre-mapping: Corridor Area



Methods

Wetlands Pre-mapping: Lake Area



Methods: Wetland Mapping

- Field points
 - Determination point: used USACE 1987 Manual and AK Supplement, GPS, field notes and photos
 - Observation point: GPS, field notes and photos
- Final desktop mapping in GIS
- Classified using NWI, and HGM class



Methods: Functional Assessment

- Used guidance in USACE AK District Regulatory Guidance Letter (RGL) 0901
- Field assessment
 - Completed functional assessment data form at each determination point



Methods: Functional Assessment

Functions Assessed:

Hydrologic

- Flood flow alteration
- Groundwater interchange
- Erosion control and stabilization

Biogeochemical

- Sediment removal
- Nutrient and toxicant removal
- Production and export of organic matter

Ecological

- General wildlife habitat suitability
- Fish habitat
- Native plant richness

Sociological

- Educational, scientific, recreational, or subsistence use
- Uniqueness and heritage

Functions adapted from USACE AK District RGL 0901

Methods: Functional Assessment

- Post-field assessment
 - Grouped wetlands into 15 ‘functional classes’ based on vegetation type, HGM position, and Project location
 - Assessed wetland functions at the level of the functional class, based on determination point data
 - Categorization: functional classes assigned to RGL 0901 functional category (I-IV)



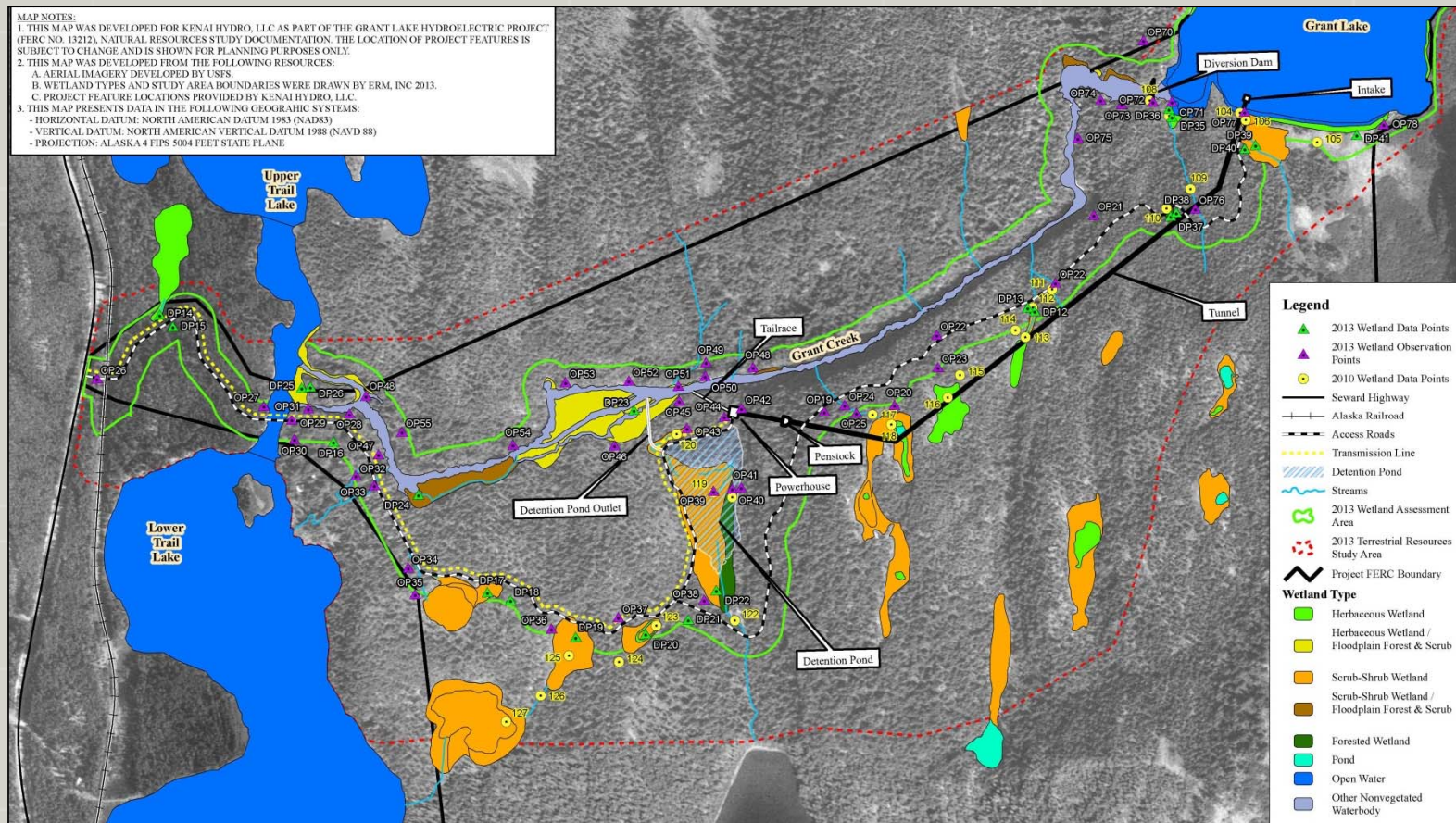
Results: Wetland Mapping

Vegetated wetland acres: 38 acres, 13% of vegetated area

Vegetated Wetland Communities		Acres	% Wetland Area
Herbaceous Wetlands		6	15%
Scrub-Shrub Wetlands		21	54%
Forested Wetlands		1	2%
Herbaceous Wetland / Floodplain Forest & Scrub		3	8%
Scrub-Shrub Wetland / Floodplain Forest & Scrub		8	21%
Vegetated Wetland Subtotals		38	
Non-Vegetated Waters		Acres	% Waters Area
Open Water - Lake		1650	99%
Open Water - Ponds		0	0%
Riverine		10	1%
Unvegetated Water Subtotals		1660	
WETLAND & WATER TOTALS		1698	

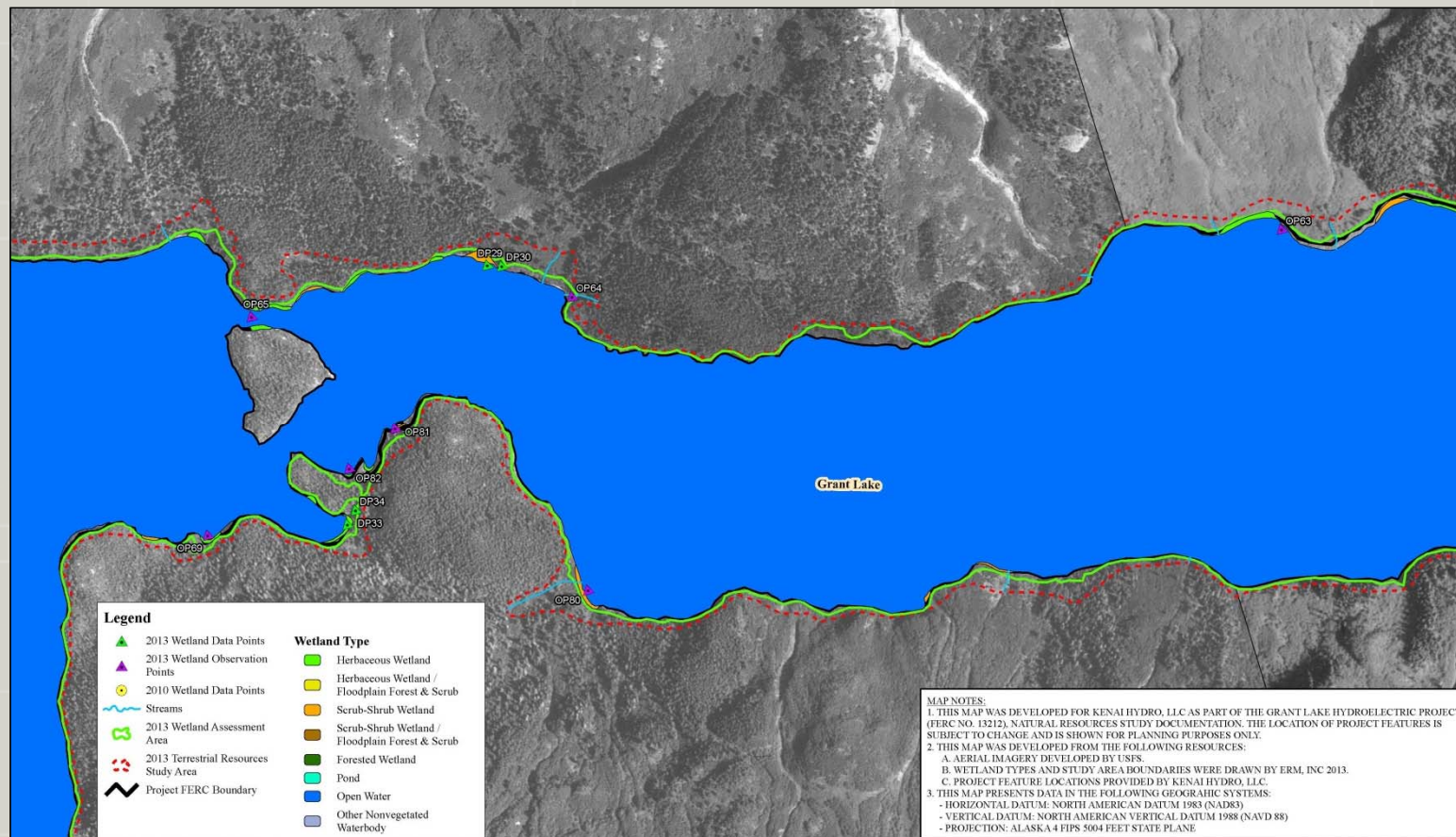
Results

Wetlands mapping: Corridor area



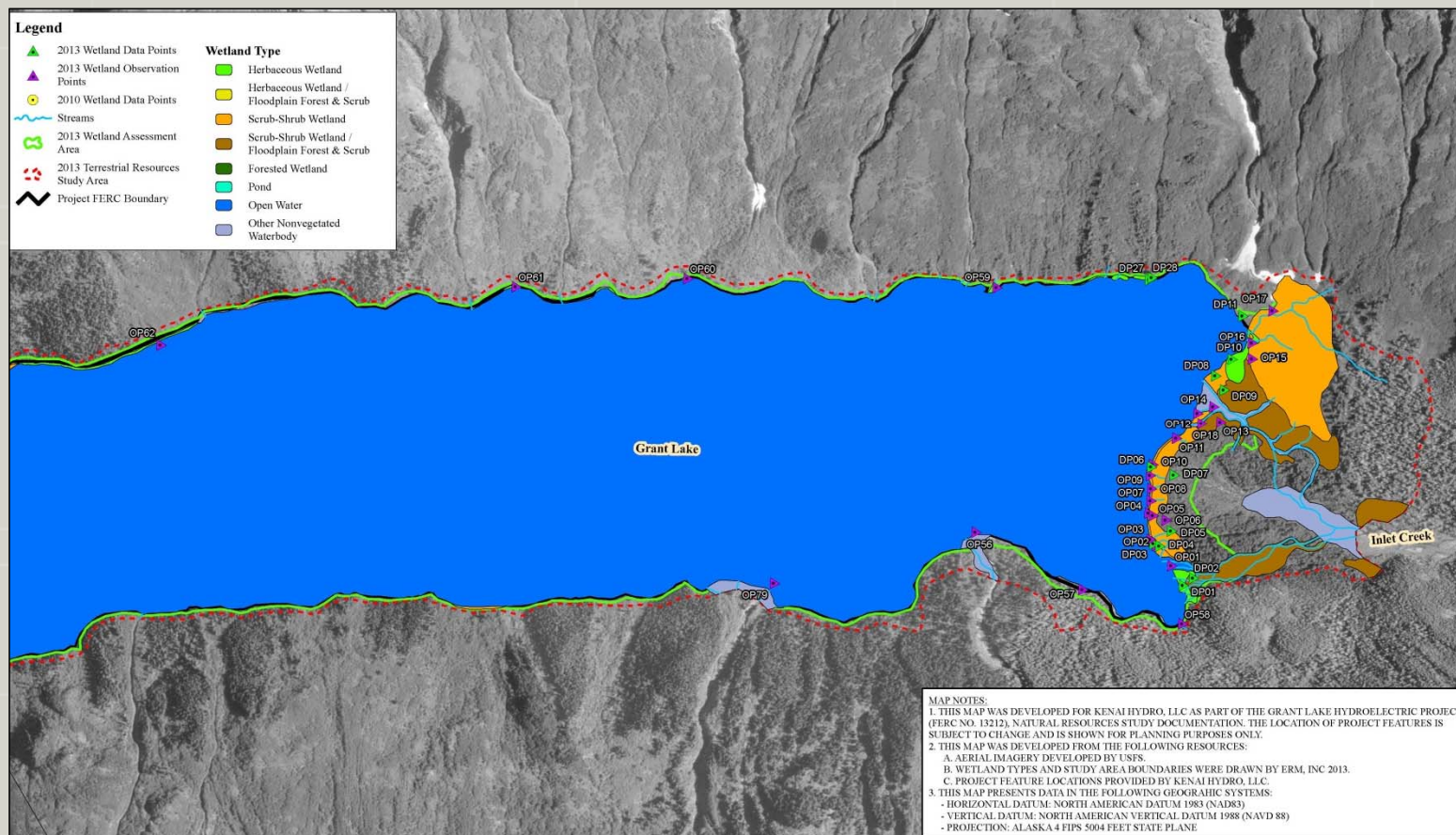
Results:

Wetlands mapping: Lake area



Results:

Wetlands mapping: Lake inlet area



Herbaceous wetlands



Herbaceous depressional



Herbaceous lacustrine

Scrub-shrub wetlands



Scrub shrub depressional



Scrub shrub lacustrine



Scrub shrub riverine

Forested wetlands



Forested slope wetland

Herbaceous wetland / Floodplain forest and scrub wetlands



Riverine wetland



Riverine wetland /
non-wetland complex

Scrub-shrub wetland / Floodplain forest and scrub wetlands



Riverine wetland



Riverine wetland /
non-wetland complex

Results: Functional Assessment

Functional Area		Functional Class	Wetland Cover Type	Hydrogeomorphic Position
Transmission Corridor / Facilities		Herbaceous depressional wetland	Herbaceous Wetland	Depressional
		Deciduous scrub shrub depressional wetland	Scrub Shrub Wetland	Depressional
		Broadleaved evergreen scrub shrub depressional wetland		
		Needle leaved evergreen scrub shrub depressional wetland		
		Small stream scrub shrub riparian		Riverine
		Forested slope wetland	Forested Wetland	Slope
Grant Creek Corridor		Grant Creek herbaceous riparian	Herbaceous Wetland / Floodplain Forest & Scrub	Riverine
		Grant Creek scrub shrub riparian	Scrub-Shrub Wetland / Floodplain Forest & Scrub	
Grant Lake	Lake Inlet	Grant Lake inlet herbaceous wetland	Herbaceous Wetland	Lacustrine
		Grant Lake inlet herbaceous inundated wetland		
		Grant Lake inlet scrub shrub wetland	Scrub Shrub Wetland	
		Grant Lake inlet scrub shrub riparian	Scrub-Shrub Wetland / Floodplain Forest & Scrub	Riverine
	Lake Shore	Grant Lake herbaceous lake fringe wetland	Herbaceous Wetland	Lacustrine
		Grant Lake scrub shrub lake fringe wetland	Scrub Shrub Wetland	
		Lake Outlet	Grant Lake outlet herbaceous wetland	

Results: Functional Assessment

Functional Area	Functional Class	Representative Data Point(s)	Flood Flow Alteration	Sediment Removal	Nutrient, & Toxicant Removal	Erosion Control and Shoreline Stabilization	Production and Export of Organic Matter	General Wildlife Habitat Suitability	Fish Habitat	Native Plant Richness	Educational or Scientific	Groundwater Interchange	Uniqueness and Heritage
Transmission Corridor / Facilities	Herbaceous depressional wetland	DP14	Moderate	High	High	High	High	High	NA	Moderate	Moderate	High	Low
	Deciduous scrub shrub depressional wetland	DP22	Moderate	Moderate	High	NA	High	High	NA	High	Moderate	High	Low
	Broadleaved evergreen scrub shrub depressional wetland	DP17, DP20	Moderate	Moderate	High	NA	Moderate-High	High	NA	Moderate	Moderate	Moderate-High	Low
	Needle leaved evergreen scrub shrub depressional wetland	DP19	Moderate	Moderate	High	NA	High	High	NA	Moderate	Moderate	High	Low
	Small stream scrub shrub riparian	DP12, DP39	Moderate	Moderate-High	High	High	High	High	NA	Moderate-High	Moderate	Moderate-High	Low
	Forested slope wetland	DP37	Moderate	Moderate	Moderate	NA	Moderate	High	NA	High	Moderate	High	Low
Grant Creek Corridor	Grant Creek herbaceous riparian	DP23, DP25	Moderate	High	High	High	High	High	High	Moderate-High	Moderate	Moderate-High	Low
	Grant Creek scrub shrub riparian	DP24	Moderate	High	High	High	High	High	High	High	Moderate	High	Low
Lake Inlet	Grant Lake inlet herbaceous wetland	DP01	Moderate	Moderate	High	Low	High	High	NA	Moderate	Moderate	Moderate	Low
	Grant Lake inlet herbaceous inundated wetland	DP10	Moderate	High	High	Low	Moderate	Moderate	NA	Moderate	Moderate	Moderate	Low
	Grant Lake inlet scrub shrub wetland	DP03, DP04, DP06, DP08	Moderate-High	Moderate-High	High	High	High	High	NA	Moderate	Moderate	Moderate	Low
	Grant Lake inlet scrub shrub riparian	DP02, DP09	Moderate	Moderate-High	Moderate-High	High	Moderate-High	Moderate	NA	Moderate	Moderate	Moderate	Low
Lake Shore	Grant Lake herbaceous lake fringe wetland	DP27, DP33	Moderate	High	High	High	High	Moderate-High	NA	Moderate	Moderate	Moderate-High	Low
	Grant Lake scrub shrub lake fringe wetland	DP29, DP31	Moderate	Moderate-High	High	High	High	High	NA	Moderate	Moderate	Moderate-High	Low
Lake Outlet	Grant Lake outlet herbaceous wetland	DP35	Moderate	High	High	High	High	High	NA	Moderate	Moderate	High	Low

Results: Functional Assessment

- Categorization
 - Category I, highest quality; category IV, lowest quality/degraded

Project Area	Acres per Category			
	I	II	III	IV
Transmission Corridor / Facilities	0.0	4.7	1.6	0.0
Grant Creek Corridor	0.0	4.4	0.0	0.0
Grant Lake	0.0	19.0	8.6	0.0
Total Acres by Category	0	28	10	0



Wetlands: Potential Qualitative Construction Impacts (Short-Term)

Potential direct impacts

- Clearing/grubbing, soil disturbance, temporary water turbidity, changes to routing delivery (Grant Creek), shoreline/bank disturbance, reduced capacity to perform certain functions.

Potential Indirect Impacts

- Weed infestation, erosion, sedimentation, poor re-establishment of native veg, reduced capacity to perform certain functions

Wetlands: Potential Qualitative Operational Impacts (Long-Term)

Potential direct impacts

- Wetland excavation or fills; wetland inundation or sedimentation; altered bank, shoreline, or lakebed; permanent change in certain wetland functions

Potential indirect impacts

- General: change in functional capacity, sedimentation, weed infestation, erosion, water turbidity, poor re-establishment of native veg;
- Detention pond fluctuation: wetland expansion, inundation, sedimentation.
- Lake elevation fluctuation: wetland expansion, inundation, or drainage; shoreline erosion or deposition;
- Grant Creek flow regime: wetland expansion or loss

Deliverables and Next Steps:

- Deliverables
 - Final Wetlands and Waters Report
 - Final geodatabase
- Next steps for Project regarding wetlands
 - Assess potential impacts to wetlands and waters
 - Develop construction and operation BMP's
 - Comprehensive Mitigation Plan

Questions?



Terrestrial Wildlife Studies



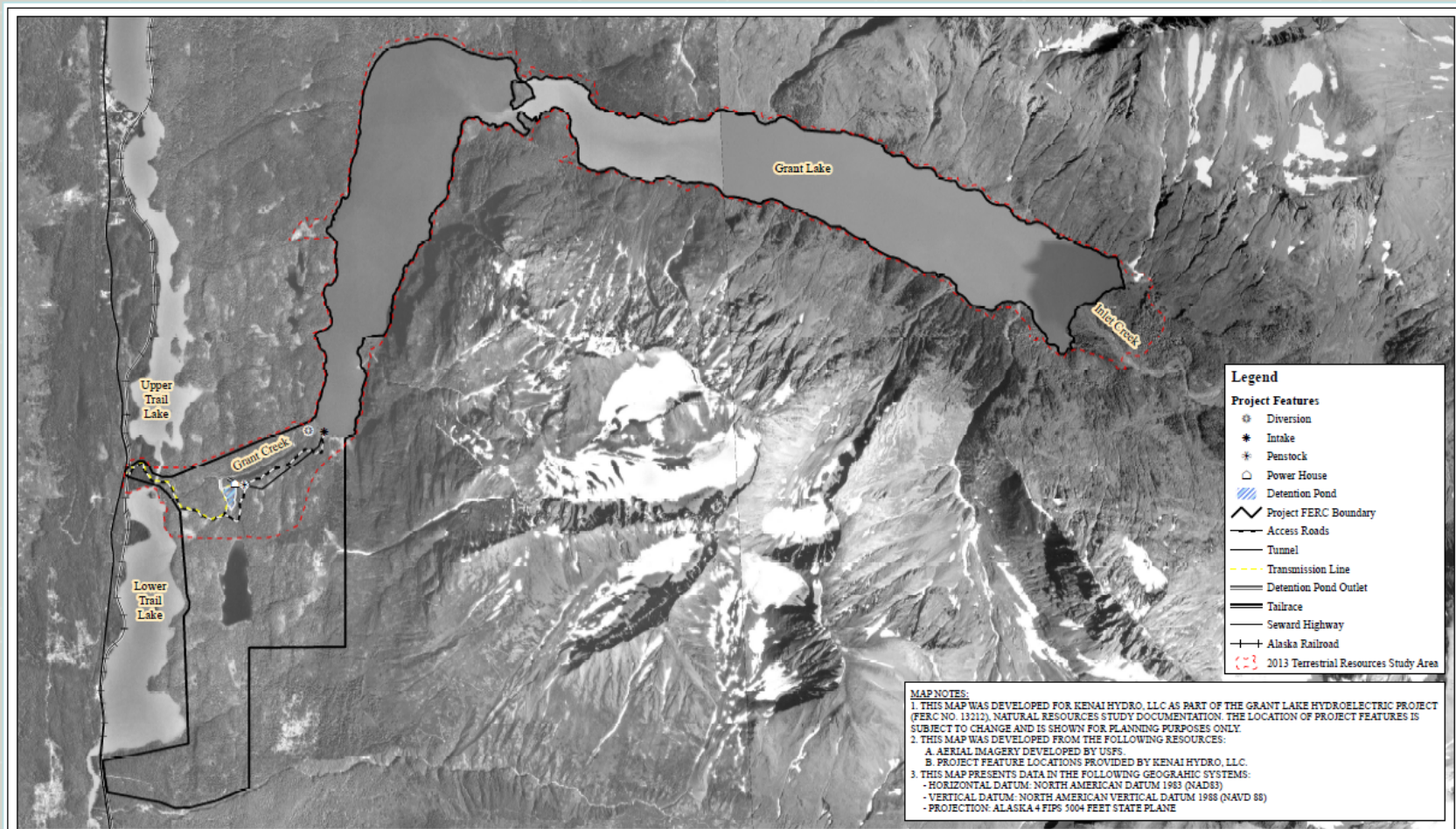
Terrestrial Wildlife Studies

Objectives

The 2013 Wildlife Study was conducted in accordance with the approved Study Plan (KHL 2013). The objectives the study were to:

- Document presence and distribution information to allow the Project to minimize or avoid impacts to protected species, including bald eagles and other raptors, shorebirds, waterbirds, and landbirds of special interest;
- Quantify the distribution and abundance of target wildlife species during key seasons of activity in the study area;
- Document the species composition of avian communities, particularly landbirds, shorebirds, and waterbirds; and
- Classify and map wildlife habitat in the study area in conjunction with the Botanical Resources Study.

Terrestrial Wildlife Studies



Terrestrial Wildlife Studies

Study Component #1 – Raptor Nesting Surveys

- Raptor Nest Survey: Completed 2010
- Goshawk Nest Ground-Based Survey: 2013 Completed; June & early-July, 2014

Study Component #2 – Breeding Landbirds and Shorebirds

- Breeding Landbird and Shorebird Study: Completed 2010
- Breeding Landbird and Shorebird Study: Completed 2013

Study Component #3 – Waterbirds

- Waterbird Breeding Surveys: Completed 2010
- Harlequin Duck Surveys: Completed 2010
- Waterbird Brood-Rearing Survey: Completed 2010
- Winter Waterbird Survey: 2013 Completed; March 2014

Study Component #4 – Terrestrial Mammals

- Mountain goats and Dall sheep Survey: Complete 2010
- Bat Surveys: Complete 2010
- Bear: Complete 2010
- Winter Moose Surveys: 2013 Completed; March 2014

Reviewed Documents & Resources



Grant Lake Hydroelectric Project Detailed Feasibility Analysis (1984)

2013-2014 Alaska Hunting Regulations • Brown Bear Management Report (2011) • Black Bear Management Report (2011) • Sheep Management Report (2011) • Mountain Goat Management Report (2012) • Wolf Management Report (2009) • Furbearer Management Report (2010)

Trail River Landscape Assessment (2008) • Kenai Lake – Black Mountain RNA (2007)

Bird Checklists of the United States: Kenai NWR; Chugach NF • Breeding Bird Habitat Associations on the Alaska BBS (2000)

Alaska Watchlist (2010)

Interagency Brown Bear Study Team (IBBST):
A Conservation Assessment of the Kenai Peninsula Brown Bear (2001) • Kenai Peninsula Brown Bear Conservation Strategy (2000)

Cumulative Kenai Birding Festival Kenai River Float Trip Bird List (2008 – 2012)

RAPTORS

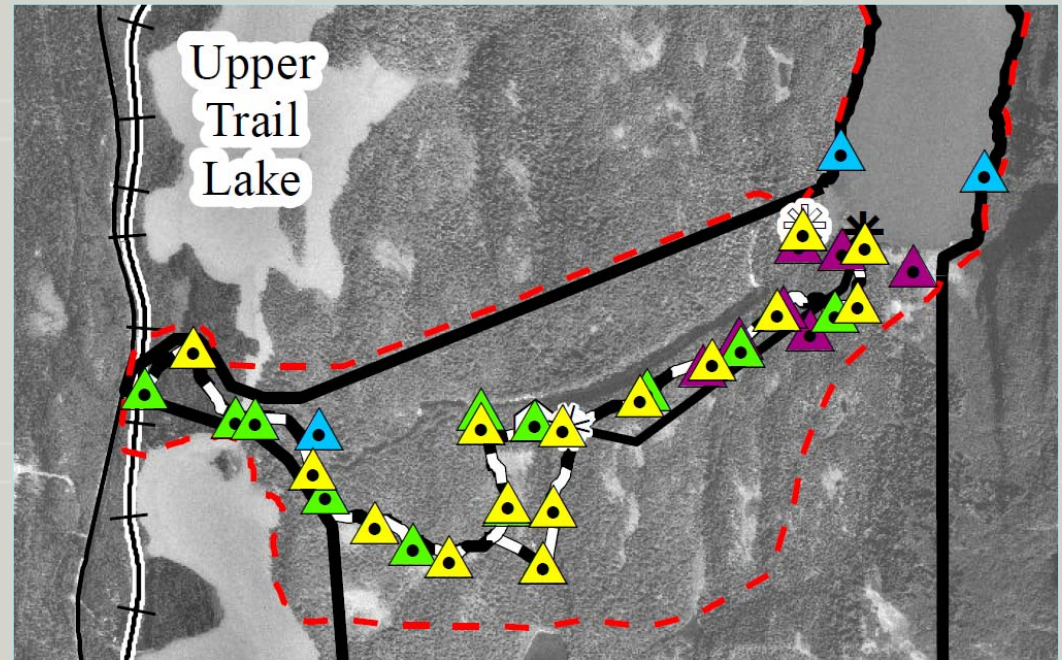
2010 Raptor Nest Surveys

- Coordinates and Shapefile for 2 BAEG nests, provided by USFS
- 2 BAEA incidental sightings (12th & 23rd July 2010)
- No NOGO recorded

RAPTORS

2013 & 2014 Northern Goshawk Broadcast Call Surveys

- Surveyed the Corridor Area
- 2013 Methods
 - Woodbridge et al. (2006)
 - 15 Points (spaced every 200m)
 - Adult Wail Call, Juvenile Begging Call



RAPTORS

2013 & 2014 Northern Goshawk Broadcast Call Surveys

- Results

15 Points Surveyed (16th & 17th June; 8th & 9th July)

1 Detection (AF based on size)

One adult female NOGO response was detected A / V June 16, 2013. The individual responded to an adult wail call during the first 3-call sequence.

The female was detected in a **coniferous hardwood** forest with False Azalea (*Menziesia ferruginea*), Dwarf Dogwood (*Cornus canadensis*), Devil's Club (*Oplopanax horridus*) and Nagoonberry (*Rubus arcticus*) dominant woody plant understory. Other non woody species included Pink Wintergreen (*Pyrola asarifolia*), Fireweed (*Chamerion angustifolium*), Oak Fern (*Gymnocarpium dryopteris*), Wood Fern (*Dryopteris expansa*), and moss species.

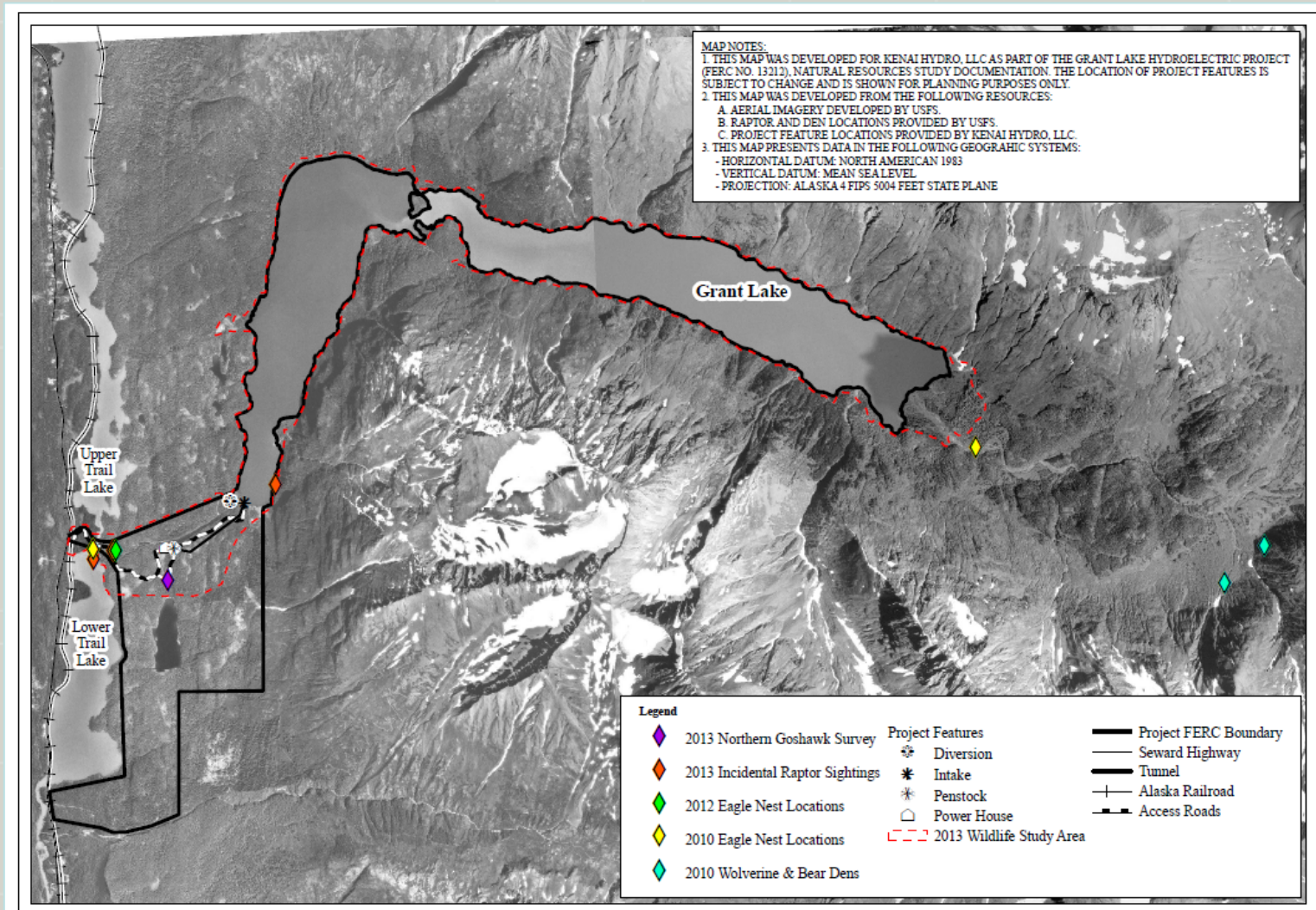
2013 Incidentals

BAEA * OSPR * MERL

RAPTORS



RAPTORS



RAPTORS

Potential Raptors in the Project Area (Occurrence includes migration and/or residence).

Raptor	Breeding Habitat
Golden Eagle Peregrine Falcon Rough-legged Hawk	Coastal or inland cliffs, bluffs, or other steep terrain
Osprey Bald Eagle Red-tailed Hawk	Large trees for stick nest placement
Sharp-shinned Hawk Northern Goshawk Great Horned Owl Northern Hawk Owl Boreal Owl	Forest
Northern Harrier Short-eared Owl	Open meadows, marshes or tundra
Great Gray Owl Merlin	Semi-open country including open coniferous woodland
Black Merlin (<i>Falco columbarius suckleyi</i>)	Rivers and coastal areas, and possibly near alpine meadows; edges of forest habitat adjoining open areas, such as muskegs, ponds, and lakes
American Kestrel	Cavity nesters, utilizing natural holes in trees, abandoned woodpecker holes, holes in buildings or cliffs, abandoned magpie nests, and similar sites. This species is also found in alpine and tundra areas not far from treeline and in open spruce and mixed spruce/aspen forests (Alexander et al. 2003)

RAPTORS

Raptor Species Detected in Project Area	Study Year
Bald Eagle	Ebasco 1984, 2010 and 2013
Northern Goshawk	2013
Sharp-shinned Hawk	Ebasco 1984
Osprey	2013
American Kestrel	Ebasco 1984
Golden Eagle	Ebasco 1984
Merlin	2013

RAPTORS

USFS Sensitive Species and Species of Special Interest

Osprey: The osprey is a Region 10 sensitive species. Potential nesting and foraging habitat was observed in the study area during the 2013 field efforts. Ospreys are very individualistic and type specific with regards to tolerance to human activities (Poole 1981).

Bald Eagle: Approximately 80 percent of all detected bald eagle nests on the Seward Ranger District are located in mature cottonwood trees within 0.25 mile of an anadromous fish-bearing stream (USFS 2008). The breeding pair documented on Grant Creek in 2013 did not appear to be impacted by human activity and presence.

Northern Goshawks: This species is a year-round resident of the Chugach National Forest (USFS 1984). The majority of NOGO nests discovered on the Seward Ranger District have been documented in old growth hemlock-spruce stands characterized by a closed canopy, large average diameter, and an open understory (USFS 2008). The spruce bark beetle has affected approximately 95 percent of large conifer trees on the Kenai; a portion of these stands may yet provide nesting or foraging habitat, but the bark beetle is likely reducing the value of these stands for Northern goshawk nesting habitat as the canopy becomes more open (USFS 2008).

RAPTORS

Potential Impacts to Raptors:

- Disturbance during breeding season (direct)
 - Nesting
 - Foraging
- Removal or loss of vegetation (direct / indirect)
 - Nesting
 - Foraging

Movement:

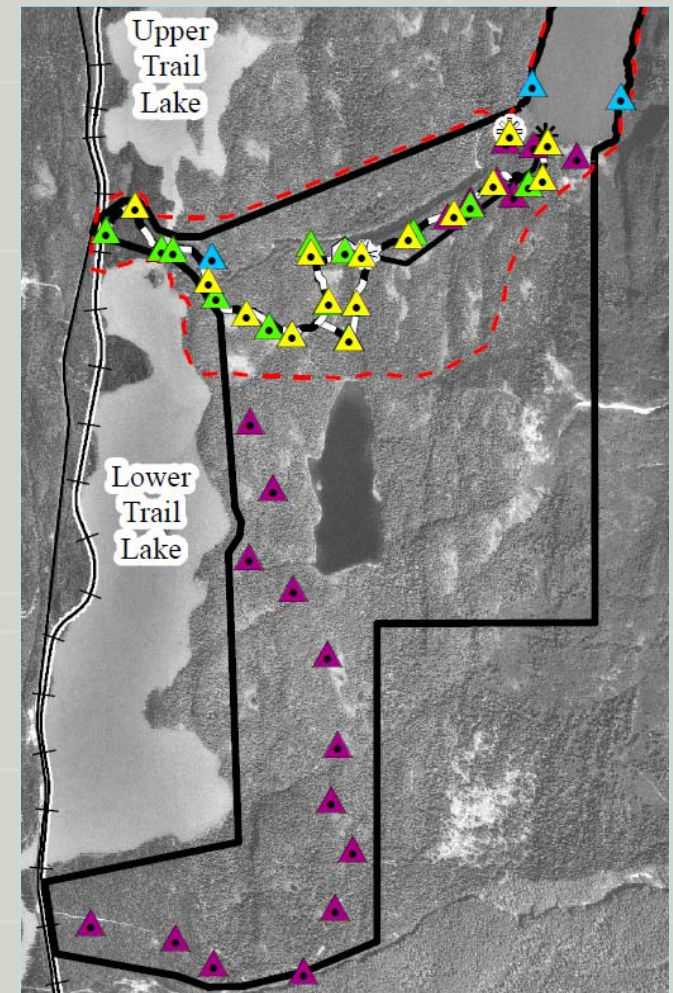
“Shy” species to other less disturbed areas

Species unable to acquire nesting and foraging habitat

BREEDING LANDBIRDS and SHOREBIRDS

2010 Breeding Landbirds and Shorebirds

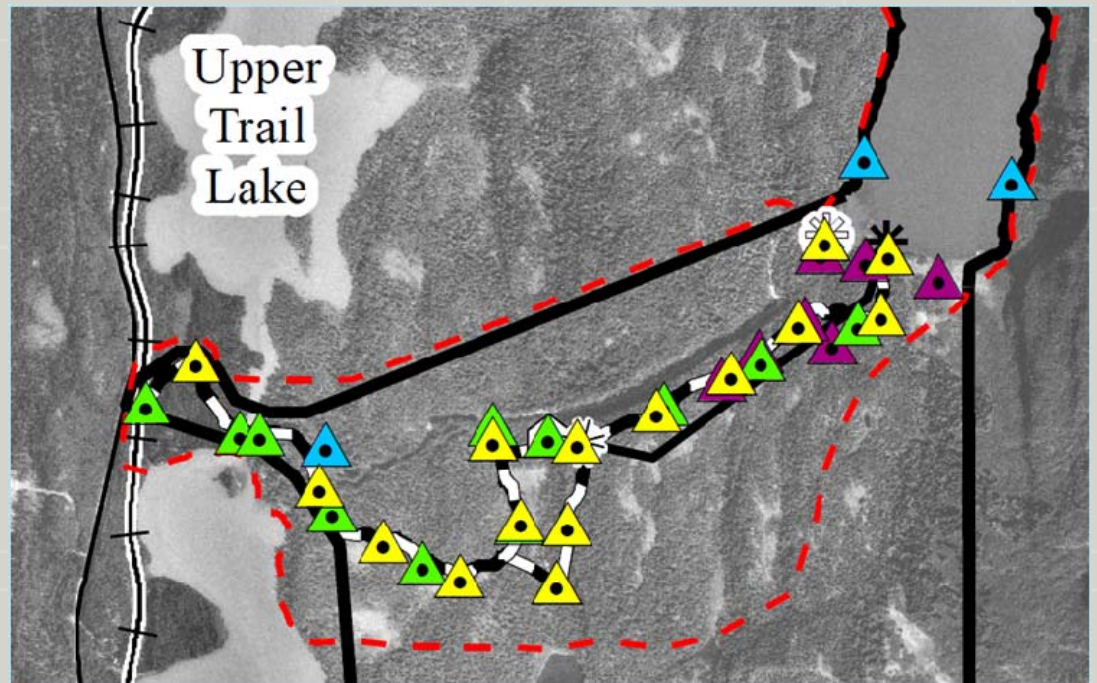
- 20 Breeding Bird Survey Points (232 Detections; 27 Species)
- Coordinates and Shapefile for Survey Points
- Incidental sightings (14 Species including OSFL & SOSA)



BREEDING LANDBIRDS and SHOREBIRDS

2013 Landbird Surveys

- Surveyed the Corridor Area
- 2013 Methods
 - ALMS (250 m)
 - Sampled Points 2 x's (residents & migrants)



BREEDING LANDBIRDS and SHOREBIRDS

2013 Landbird Surveys

- Results

14 Points Surveyed (21th & 22nd May; 15th & 16th June)

279 Detections; 31 Species

Vegetation Assessment for each Point (ALMS)

- Data Compilation

Birds

Ebasco (1984), 2010 and 2013 Field Work

Kenai Lake - Black Mountain RNA

BBS, USGS, AKNHP and Kenai Birding Festival

- Vegetation “Crosswalk”

USFS 2007 (Timber Type Coverage data 1978)

Ebasco (1984) Habitat x Kessel (1979) Associations

2013 ALMS

2013 Vegetation Type Classification

BREEDING LANDBIRDS and SHOREBIRDS

2013 Landbird Surveys

- Results

Qualitative assessment of avian species presence in sampled 2013 wildlife study area vegetation classification.

2013 Vegetation Types	Grass-Forb Meadow	Coniferous Forest	Birch (Original USFS Classification)	Coniferous Deciduous Forest	Scrub Shrub Wetland	Herbaceous Wetland / Floodplain Forest & Scrub
Number of points sampled in Vegetation Class (33 for 2010 and 2013)	1	16	1	12	2	1
Selected Species Detected						
Townsend's Warbler (1984, 2010, 2013)		X		X	X	
Varied Thrush (1984, 2010, 2013)	X	X	X	X	X	X
Additional Selected Species that may be Present in 2013 Vegetation Class						
Lesser Yellowlegs (1984)		X			X	
Olive-sided Flycatcher (2010)		X		X	X	
Solitary Sandpiper (2010)		X			X	
Townsend's Warbler (1984, 2010, 2013)			X			X
Wandering Tattler (1984)		X	X	X	X	X
Blackpoll Warbler		X		X	X	X
Marbled Murrelet		X				

BREEDING LANDBIRDS and SHOREBIRDS

2013 Landbird Surveys

2013 Vegetation Types not Sampled	Alder Scrub	Forested Wetland	Herbaceous Wetland
Selected Species that may be Present			
Lesser Yellowlegs (1984)	X	X	
Olive-sided Flycatcher (2010)	X		
Solitary Sandpiper (2010)		X	X
Townsend's Warbler (1984, 2010, 2013)		X	
Varied Thrush (1984, 2010, 2013)		X	
Wandering Tattler (1984)		X	
Blackpoll Warbler	X	X	X

2013 Incidentals

BCCH * BOCH * BRGR * BEKI * SPGR * SPSA * VGSW * CORA * ALFL * TRSW * GRAJ *
ARTE

BREEDING LANDBIRDS and SHOREBIRDS

USFS Species of Special Interest

Marbled Murrelet: Select mature or old growth conifers for nesting, and this habitat is found within the area in mature hemlock and spruce-hemlock forests. Marbled murrelets have not been observed in the Grant Lake area.

Townsend's Warbler: Detected during the Ebasco (1984), 2010, and 2013 Grant Lake surveys.

Alaska Audubon Red-Listed Species

Varied Thrush: Detected during the Ebasco (1984), 2010, and 2013 Grant Lake surveys.

Lesser Yellowlegs: Only detected during the Ebasco (1984) surveys.

Wandering Tattler: Detected during the Ebasco (1984) surveys; however, their habitat does not likely occur in the study area.

BREEDING LANDBIRDS and SHOREBIRDS

Alaska Audubon Red-Listed Species Cont.

Solitary Sandpiper: Detected during the 2010 surveys.

Kittlitz's Murrelet: Select areas of high elevation alpine areas, with little or no vegetative cover. Kittlitz's Murrelets have not been observed in the Grant Lake area and their habitat does not likely occur in the study area.

Olive-sided Flycatcher: Detected during the 2010 surveys and their habitat likely occurs in the study area.

Blackpoll Warbler: Blackpoll warblers have not been detected in the Grant Lake area; however, their habitat does occur in the study area. AKNHP indicates range is further west on Kenai "lowlands".

BREEDING LANDBIRDS and SHOREBIRDS

Potential Impacts to Breeding Landbirds and Shorebirds:

- Disturbance during breeding season (direct)
 - Nesting
 - Foraging
- Removal or loss of vegetation and / or shoreline (direct / indirect)
 - Nesting
 - Foraging

Movement:

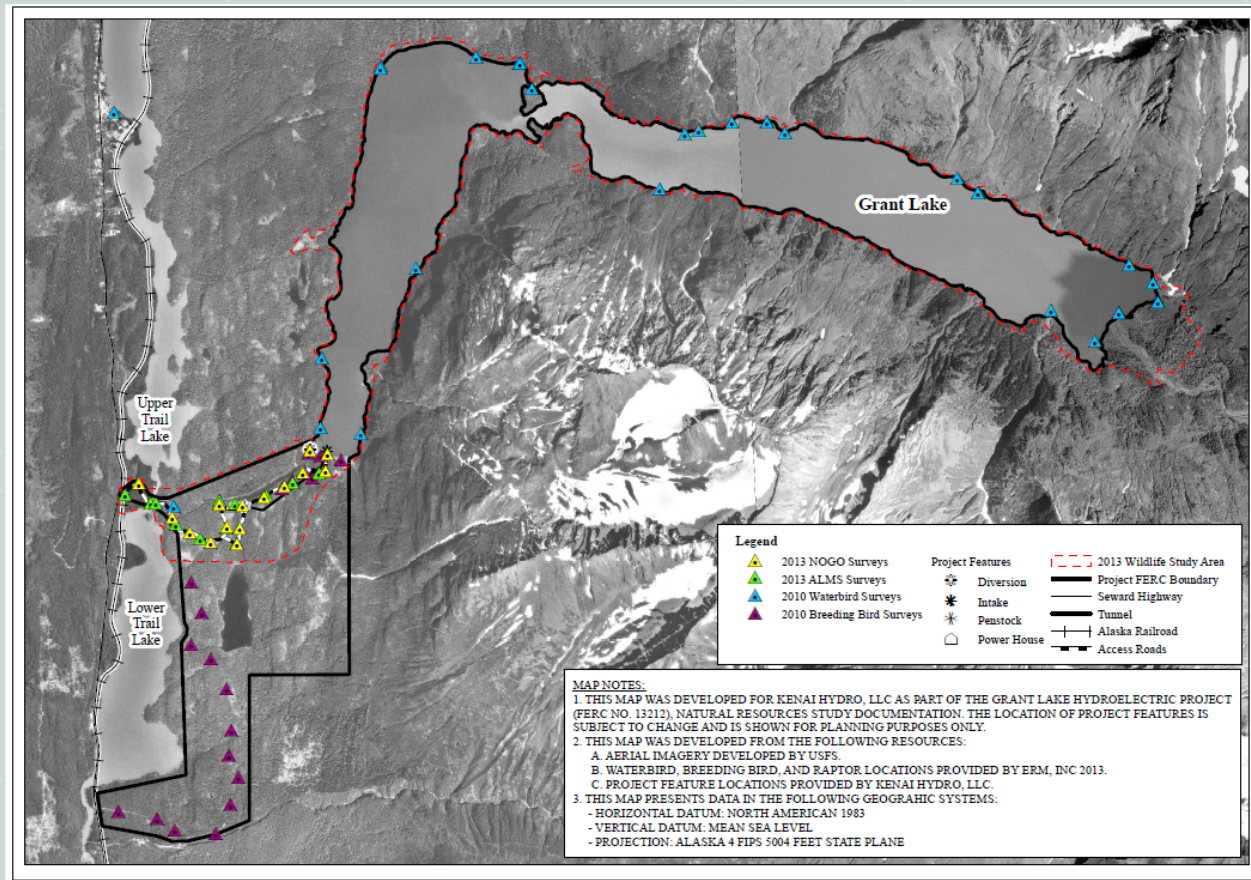
“Shy” species to other less disturbed areas

Species unable to acquire nesting, cover and foraging habitat

WATERBIRDS

2010 Waterbirds

- Four boat-based surveys on Grant Lake
- One foot survey of Grant Creek (HADU not detected)



WATERBIRDS

2013 Winter Waterbird Surveys

- 2013 Methods
 - Aerial Surveys
- 2013 Accomplishments
 - 1 survey completed
- Results
 - ^ TRUS * Merganser Species



WATERBIRDS

2013 Winter Waterbird Surveys



WATERBIRDS

2013 Winter Waterbird Surveys



WATERBIRDS

2013 Winter Waterbird Surveys



WATERBIRDS

2010 Waterbirds Surveys

2010 Waterfowl Surveys	Adults	Pairs	Adult Females	Documented Broods
Barrow's Goldeneye	X		X	X
Common Goldeneye	X		X	X
Common Loon	X			
Pacific Loon	X			
Common Merganser	X			
Red-breasted Merganser		X	X	X
Harlequin Duck * Grant Lake			X	
Mallard			X	

Ebasco (1984) AMWI * GWTE

2013 Incidentals

HADU * COLO * RBME * TRUS

WATERBIRDS

USFS Sensitive Species

Trumpeter Swan: Considered shy waterfowl, easily disturbed during nesting; however, once cygnets are mobile, adults become very protective. Trumpeter swans were observed north of the Grant Lake study area during USFS surveys (2008); however, no nests or cygnets were observed during these USFS (2008) surveys. Trumpeters were also sighted during spring 2013 below the Trail Lake narrows and during the December 2013 survey.

Alaska Audubon Red-Listed Species

Red-throated Loon: This species will typically select marshy islands for nest sites or on dry shores. They will nest on small oligotrophic lakes in diverse habitats, such as forests or tundra up to 1,070 meters (~3,510 feet) in elevation. The availability of freshwater fish limits this species' distribution. Red-throated loons have not been observed in the Grant Lake area however their nesting habitat does occur in the study area.

Yellow-billed Loon and Greater White-fronted Goose: Both species are considered non-breeders in this area and warrant no further discussion as their primary breeding habitats also do not occur in this area.

WATERBIRDS

Potential Impacts to Waterbirds:

- Disturbance during breeding season (direct)
 - Nesting
 - Foraging
- Removal or loss of vegetation and / or shoreline (direct / indirect)
 - Nesting
 - Foraging

Movement:

“Shy” species to other less disturbed areas

Species unable to acquire nesting, cover and foraging habitat

TERRESTRIAL MAMMALS

2010 Terrestrial Mammals

- Bat Survey of the historic cabin on July 23 2010
- Coordinates and Shapefile for 1 brown bear and 1 wolverine den, provided by USFS
- Six mountain goats (5 adults, 1 kid) were noted
- Incidental sightings of 3 black bear, brown bear, moose, 3 beaver, a coyote, and a porcupine

2013 Winter Moose Surveys

- 2013 Methods
 - Aerial Surveys: Gasaway et al. (1986)
- 2013 Accomplishments
 - 1 survey completed
- Results
 - No Moose or trails detected

2013 Incidentals

Numerous moose sightings (including a cow / calf pair), black bear, beaver, and lynx

TERRESTRIAL MAMMALS

2013 Winter Moose Surveys



TERRESTRIAL MAMMALS

2013 Winter Moose Surveys



TERRESTRIAL MAMMALS

Potential Impacts to Mammals:

- Disturbance (direct / indirect)
 - Females with YOY
 - Foraging
- Removal or loss of vegetation and / or shoreline (direct / indirect)
 - Cover / Shelter from Predators
 - Cover / Thermoregulation
 - Foraging

Movements:

“Shy” species to other less disturbed areas
Unable to acquire cover and foraging habitat

May lead to increased human interactions (DLP)

Terrestrial Wildlife

Best Management Practices

- USFWS (2007) National Bald Eagle Management Guidelines. (Raptors); and
- USFWS (2005) Recommended Time Periods for Avoiding Vegetation Clearing in Alaska in order to Protect Migratory Birds. (All Birds).

2014 Field Study Timeline

Study Component		2014						
		Jan	Feb	Mar	Apr	May	June	July
Wildlife	Raptors (Northern Goshawk Broadcast Surveys)							
	Winter Waterbirds (Surveys)							
	Terrestrial Mammals (Moose Surveys)							

Results from the 2013 / 2014 Winter Moose surveys and 2014 Northern Goshawk Surveys will be provided to stakeholders for review and collaboration and incorporated into the DLA.

Questions?