

SHOSHONE NATIONAL FOREST AMPHIBIAN & INVERTEBRATE SURVEYS

Survey Results 2009



Submitted by

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INTRODUCTION

Montane anurans are sensitive to environmental disturbance and many populations in the intermountain west have been shown to have declined in the past decade. Probable reasons for declines of certain montane anurans include chytrid fungus, habitat modifications, non-native species, environmental pollutants, and changes in micro- and macro-climates. The Boreal Toad (*Anaxyrus boreas boreas*), in particular, has declined in distribution and abundance throughout its range in the past 20 years and dramatic declines have occurred in the Southern Rocky Mountains. The Boreal Toad is listed as endangered by Colorado and New Mexico and is ranked as an NSS1 species within Wyoming due to declining populations. The status of Boreal Toad populations in the northern part of the species range in Wyoming are unknown. Limited surveys and little if any systematic monitoring outside of national parks have occurred in the northern part of the species' range in Wyoming.

In 2008 the Shoshone National Forest contracted the Wyoming Natural Diversity Database (WYNDD) to conduct a 2-year amphibian survey of historic and potential boreal toad sites. In 2009 the Shoshone National Forest also requested that WYNDD conduct invertebrate surveys in conjunction with amphibian surveys at a selection of fens in the northern portion of the forest. Little is currently known about the fauna of northern fens and the ability of these fens to support amphibian populations.

WYNDD conducted amphibian surveys at 47 locations throughout the Shoshone National Forest in 2009. We report methods used to survey for amphibians and invertebrates, a summary of results for each survey site, and habitat photographs.

METHODS

Site Overview

We conducted amphibian surveys at 47 sites in the Shoshone National Forest. Sites were distributed from Louis Lake in the southern tip of the forest to fens in the Beartooth Mountains at the northern extent of the Shoshone National Forest, just south of the Montana border. Survey locations ranged in elevation from 6520 ft. to 9720 ft. and included pools, ponds, wetlands, streams, lake outlets/inlets, and oxbows.

Amphibian Surveys

Survey locations were considered predetermined if locations were selected in advance based on maps, aerial photos, recommendations, or prior surveys. Locations were considered opportunistic if potential boreal toad habitat was found while en route to predetermined sites. We also surveyed a subset of fens in the northern part of the forest which were previously studied from 2005-2007 and ranked based on their likelihood of containing well-developed peatlands (Heidel and Rodemaker 2008). We sampled across peatland likelihood rankings (1 – 5; with 1 = lowest and 5 = highest), and across peatland types ranging from tree-dominated to graminoid-dominated peatlands.

We used timed Visual Encounter Surveys (VES) to survey for amphibians at all sites. Surveyors searched all accessible shorelines, emergent vegetation, and immediately adjacent uplands for adult, juvenile, and larval amphibians as well as egg masses. Use of hip boots and dip nets allowed surveyors to search shallow water and emergent vegetation more effectively. All amphibians found were identified to species if possible. In several cases, individuals from tadpole aggregations were collected and preserved for later identification in the lab. Because surveys took place during the breeding season, amphibians (especially Boreal Chorus Frogs) at some survey sites could be heard calling. We recorded all incidents of amphibians calling during VES surveys and identified calls to species. We also recorded weather and habitat conditions at all survey sites and took habitat photos.

Invertebrate Surveys

Invertebrates were sampled from 7 fens across the range of peatland likelihood rankings. Invertebrates were collected using a D-frame dip net, and samples were sieved with 500 µm mesh and preserved in ~70% ethanol. In the laboratory, invertebrates were separated from the debris and identified to the lowest practical taxonomic unit (typically genus for insects) using a dissecting microscope. Insects were identified using Merritt et al. (2008) and non-insect invertebrates were identified using Thorp and Covich (2009).

RESULTS & DISCUSSION

Amphibians

Other than a single adult male Boreal Toad detected in the Wind River Area west of Dubois (see Site Overview) at Clint Creek (Site C), we confirmed presence of Boreal Toads at only 3 sites in the northern extent of the Shoshone National Forest. Boreal Toads were detected in the Northern Fen Area primarily along the Clarks Fork River corridor at the Swamp Lake, Lily Lake, and Deadman Creek sites (Table 1). We also documented unconfirmed but possible Boreal Toads at 2 additional locations, Gilbert Fen and Carter_05. Gilbert fen is located near Lily Lake (see Site Overview), which is a known breeding site for Boreal Toads. Carter_05, however, is located in the Carter Mountain Area and Boreal Toads have not been previously documented here. Amphibian surveys in the Carter Mountain Area were curtailed by impending storms, but the Carter_05 site contained the most promising Boreal Toad habitat in this area and warrants further searches. Both Spotted Frogs (*Rana luteiventris*) and Boreal Chorus Frogs (*Pseudacris maculata*) were confirmed at 7 survey sites, primarily in the Wind River Area west of Dubois.

The northern fens sampled were largely devoid of amphibians. We sampled 17 fens covering all fen categories and peatland types (Table 2). Of these, only 3 fens in the Swamp Lake and Lily Lake areas contained amphibians, including Boreal Toads. No discernable patterns were found to explain occupancy of a fen by amphibians; however, we did not collect water

quality data. See individual site maps below for detailed descriptions of habitat, search effort, and results. See also habitat photographs for most survey sites in the Appendix.

Invertebrates

The invertebrates collected in fens were diverse, including insects, mollusks, worms, and crustaceans (Table 2). The fens contained invertebrates likely to occur in standing water habitats, such as dragonflies, damselflies, and phantom midges. The most abundant taxon was Chironomidae, which is a common food item for predaceous insects, fish, and other insectivores. The taxa that were collected in many of the fens were snails, fingernail clams, phantom midges, non-biting midges, scuds, caddisflies, aquatic beetles, biting midges, worms, black flies, mosquitoes, damselflies, and dragonflies. The water quality in these fens is likely good as indicated by the presence and reproduction of caddisflies, mayflies, stoneflies, dragonflies, damselflies, snails, and scuds. A dragonfly in the genus *Somatochlora* was collected in Meadow 5 fen. Although we did not identify this insect to species due to lack of a species key, *Somatochlora hudsonica* is a Forest Service Region 2 Sensitive Species that could possibly occur in the sample area.

Literature Cited:

- Heidel, B. and E. Rodemaker. 2008. Inventory of peatland systems in the Beartooth Mountains, Shoshone National Forest, Park County, Wyoming. Report prepared for: Environmental Protection Agency. Wyoming Natural Diversity Database, Laramie, WY 82071
- Merritt, R.W., K.W. Cummins, and M.B. Berg (Eds). 2008. An introduction to the aquatic insects of North America. Kendal/Hunt Publishing Company, Dubuque, Iowa.
- Throp, J.H., and A.P. Covich (Eds). 2009. Ecology and classification of North American freshwater invertebrates. Academic Press, San Diego, California.

Table 1. Results of 2009 amphibian surveys conducted by WYNDD at 47 sites in the Shoshone National Forest. Results are summarized by site and include search effort, Boreal Toad presence, and all amphibians and life stages observed.

Site Name	Site Selection	Survey Date	Observers	Elevation	Search Effort (min)	Boreal Toad Presence	Amphibian Observation Data
Pelham Lake	Predetermined	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8817	100	No	1 <i>Rana luteiventris</i> (adult), 1 <i>Rana spp.</i> egg mass
Pelham Lake Rd. (A)	Opportunistic	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8020	96	No	3 <i>Rana luteiventris</i> (adult), ≤ 100 <i>R. luteiventris</i> tadpoles, 1 <i>Pseudacris maculata</i> (heard calling)
Pelham Lake Rd. (B)	Opportunistic	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	7820	11	No	None
Clint Creek A & B	Predetermined	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	7790, 7880	200	No	2 <i>Rana luteiventris</i> (adult), 8 <i>R. luteiventris</i> (juvenile), 5 <i>Pseudacris maculata</i> (adult)
Clint Creek C	Predetermined	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	7700	260	Yes	1 <i>Anaxyrus boreas</i> (adult male), 9 <i>Pseudacris maculata</i> (adult)
Wind River Oxbow	Opportunistic	15-Jun-09	Estes-Zumpf, James, Gulka, Hammer	7660	144	No	2 <i>Rana luteiventris</i> (juvenile), 16 <i>Pseudacris maculata</i> (adult), ≤ 10 <i>P. maculata</i> tadpoles, 1 unknown amphibian (large and dark)
Middle Fork Long Crk. A	Predetermined	16-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8400	11.5	No	1 unknown amphibian

Middle Fork Long Crk. B	Predetermined	16-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8380	11.75	No	6 <i>Pseudacris maculata</i> (adult)
Middle Fork Long Crk. C	Predetermined	16-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8370	80	No	2 <i>Rana luteiventris</i> (adult), 1 likely <i>R. luteiventris</i> (adult), 6 <i>Pseudacris maculata</i> (adult), ≤ 100 likely <i>P. maculata</i> tadpoles (collected and ID'ed in lab)
Middle Fork Long Crk. D	Predetermined	16-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8380	47.5	No	5 <i>Pseudacris maculata</i> (adult)
Middle Fork Long Crk. E	Predetermined	16-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8420	44.5	No	None
Louis Lake Wetland A	Predetermined	17-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8600	66	No	1 unknown amphibian
Louis Lake Wetland B	Predetermined	17-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8600	48	No	None
Louis Lake Wetland C	Predetermined	17-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8740	34	No	None
Louis Creek	Predetermined	17-Jun-09	Estes-Zumpf, James, Gulka, Hammer	8560	51	No	None
Lily Lake	Predetermined	23-Jun-09	Gulka, Hammer	7680	190	Yes	1 <i>Anaxyrus boreas</i> (small adult)
Mud Fen_5	Predetermined	23-Jun-09	Gulka, Hammer	7700	117	No	None
Gilbert Fen	Predetermined	24-Jun-09	Gulka, Hammer	7680	174	?	1 possible <i>Anaxyrus boreas</i> , 2 unknown amphibians

Deadman Creek	Opportunistic	25-Jun-09	Gulka, Hammer	6820	50	Yes	32 <i>Anaxyrus boreas</i> (juveniles), 1 possible <i>A. boreas</i> (adult)
Deadman Swamp	Predetermined	25-Jun-09	Gulka, Hammer	6820	94	No	None
Deadman Pond 2	Predetermined	25-Jun-09	Gulka, Hammer	6820	80	No	1 unknown amphibian
Camp Creek Swamp	Predetermined	25-Jun-09	Gulka, Hammer	6840	20	No	None
Clay Fen A_5	Predetermined	25-Jun-09	Gulka, Hammer	8980	92	No	None
Clay Fen B_3QA	Predetermined	26-Jun-09	Gulka, Hammer	8840	34	No	None
Clay Fen C_3Q	Predetermined	26-Jun-09	Gulka, Hammer	8880	79.5	No	None
Swamp Lake A	Predetermined	30-Jun-09	Gulka, Hammer	6600	60	Yes	1 <i>Anaxyrus boreas</i> (adult), ≤ 100 <i>A. boreas</i> tadpoles, 1 possible <i>A. boreas</i> (adult)
Swamp Lake B	Opportunistic	1-Jul-09	Gulka, Hammer	6600	-	No	None
Corral Creek	Predetermined	30-Jun-09	Gulka, Hammer	6600	24	No	None
Corral Creek Swamp	Predetermined	30-Jun-09	Gulka, Hammer	6600	33	No	3 <i>Rana luteiventris</i> (adult)
Fen A_2	Predetermined	30-Jun-09	Gulka, Hammer	6560	56	No	None
Fen B_1	Predetermined	30-Jun-09	Gulka, Hammer	6520	28	No	None
Fen C_4	Predetermined	1-Jul-09	Gulka, Hammer	9720	20	No	None
Meadow_5	Predetermined	29-Jun-09	Gulka, Hammer	9560	42	No	None
Fantan Lake Outlet	Opportunistic	1-Jul-09	Gulka, Hammer	9570	32	No	None
Fantan_3	Predetermined	1-Jul-09	Gulka, Hammer	9560	38	No	None

Fantan_3b	Predetermined	29-Jun-09	Gulka, Hammer	9560	78	No	None
Fantan_4	Predetermined	1-Jul-09	Gulka, Hammer	9600	38	No	None
Chain_2Q	Predetermined	2-Jul-09	Gulka, Hammer	9440	78	No	None
Carter_01	Predetermined	7-Jul-09	Gulka, Hammer	8150	37	No	None
Carter_02	Predetermined	8-Jul-09	Gulka, Hammer	8290	36	No	None
Carter_03	Predetermined	8-Jul-09	Gulka, Hammer	8400	72	No	None
Carter_04	Predetermined	8-Jul-09	Gulka, Hammer	8400	16	No	None
Carter_05	Predetermined	8-Jul-09	Gulka, Hammer	7860	40	?	1 possible <i>Anaxyrus boreas</i> , 1 unknown amphibian
Carter_07	Predetermined	7-Jul-09	Gulka, Hammer	8630	32	No	None
Carter_08	Predetermined	8-Jul-09	Gulka, Hammer	7700	26	No	1 <i>Rana luteiventris</i> (adult), 1 unknown frog (adult)
Carter_09	Predetermined	8-Jul-09	Gulka, Hammer	7880	22	No	None
Carter_11	Predetermined	7-Jul-09	Gulka, Hammer	8560	48	No	None

Table 2. Northern fens sampled by WYNDD in 2009 for amphibians and/or invertebrates. Fen category refers to the likelihood of well-developed peatlands (1 = low, 5 = high). Peatland type is coded as follows: T = tree-dominated, S = shrub-dominated (with shrub height M = medium and L = low), G = graminoid-dominated, AA = aapamire, FL = floating mat, following Heidel and Rodemaker (2008).

Site Name	Fen Category	Elevation (ft)	Peat Type	Survey Date	Amphibians?	Invertebrate Species	Common Name
Fen B_1	1	6520	T	30-Jun-09	No	<i>Aedes</i>	Mosquito
						Cladoceran	Water flea
						Copepoda	A crustacean
						<i>Eucorethra underwoodi</i>	Phantom midge
						Hemiptera (immature)	True bug
						Lymnaeidae	A snail
						Ostracoda	A crustacean
						Physidae	A snail
						Planorbidae	A snail
						Spheariidae	Fingernail clam
Fen A_2	2	6560	-	30-Jun-09	No	Acari	A mite
						<i>Acerpenna</i>	A mayfly
						Chironomidae	Non-biting midge
						<i>Dixella</i>	Dixid midge
						<i>Gammarus</i>	Scud
						<i>Lepidostoma</i>	A caddisfly
						Lymnaeidae	A snail
						<i>Malenka</i>	A stonefly
Melyridae	A beetle						

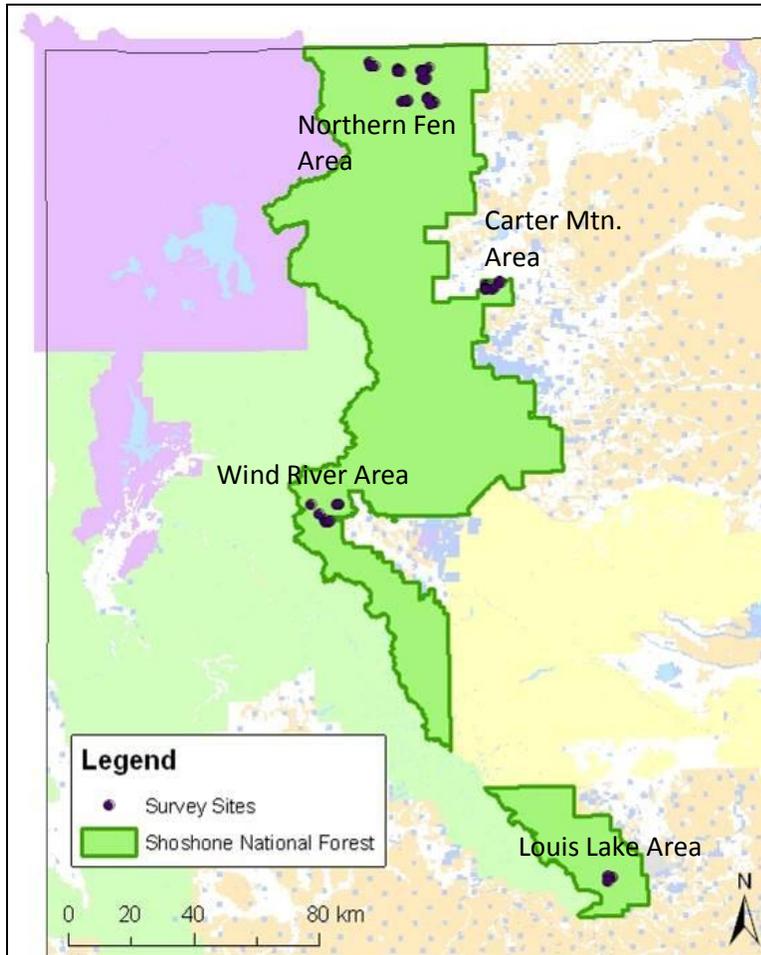
						<i>Simulium</i>	Black fly
Chain_2Q	2?	9440	G	2-Jul-09	No	Not sampled	
						<i>Aedes</i>	A mosquito
						<i>Bezzia/Palpomyia</i>	A biting midge
						Chironomidae	A non-biting midge
						Copepoda	A crustacean
						<i>Dixa</i>	Dixid midge
Gilbert Fen	3	7680	G SL	24-Jun-09	Yes	Hydrophilidae	Water scavenger beetle
						Nematoda	Nematode
						Nemouridae	Spring stonefly
						Oligochaeta	A worm
						Ostrcoda	A crustacean
						<i>Simulium</i>	Black fly
						Spheariidae	Fingernail clam
Fantan_3b	3	9560	G	29-Jun-09	No	Not sampled	
Fantan_3	3	9560	G	1-Jul-09	No	Not sampled	
Clay Fen B_3QA	3?	8840	SL	26-Jun-09	No	Not sampled	
						<i>Aedes</i>	Mosquito
						<i>Aquarius</i>	Water strider
						<i>Chaoborus</i>	Phantom midge
Clay Fen C_3Q	3?	8880	SL G	26-Jun-09	No	Chironomidae	Non-biting midge
						Cladoceran	A crustacean
						<i>Coenagrion/Enallagma</i>	Pond damselfly
						<i>Mochlonyx</i>	Phantom midge
						Oligochaeta	Worm

						Ostracoda	A crustacean
						<i>Probezzia</i>	Biting midge
						Spheariidae	Fingernail clam
Fantan_4	4	9600	AA	1-Jul-09	No	Not sampled	
Fen C_4	4	9720	G	1-Jul-09	No	Not sampled	
Corral Creek Swamp	5	6600	G SM T FM AA	30-Jun-09	Yes	Not sampled	
						Acari	A mite
						<i>Agabus</i>	Predaceous diving beetle
						<i>Anax</i>	Hawker dragonfly
						<i>Bezzia/Palpomyia</i>	Biting midge
						<i>Caenis</i>	A mayfly
						Chironomidae	Non-biting midge
						Cladocera	A crustacean
						<i>Coenagrion/Enallagma</i>	Pond damselfly
						<i>Cordulia shurtleffi</i>	Emerald dragonfly
Swamp Lake B	5	6600	G SM T FM AA	1-Jul-09	No	Corixidae (immature)	Water boatman
						<i>Eocosmoecus</i>	Northern caddisfly
						Erpobdellidae	A leech
						<i>Gammarus</i>	A scud
						<i>Hyaella</i>	A scud
						<i>Leucorrhinia</i>	Common skimmer dragonfly
						Lymnaeidae	A snail
						Nematoda	Nematode
						<i>Nemotaulius hostiles</i>	Northern caddisfly
						Oligochaeta	A worm

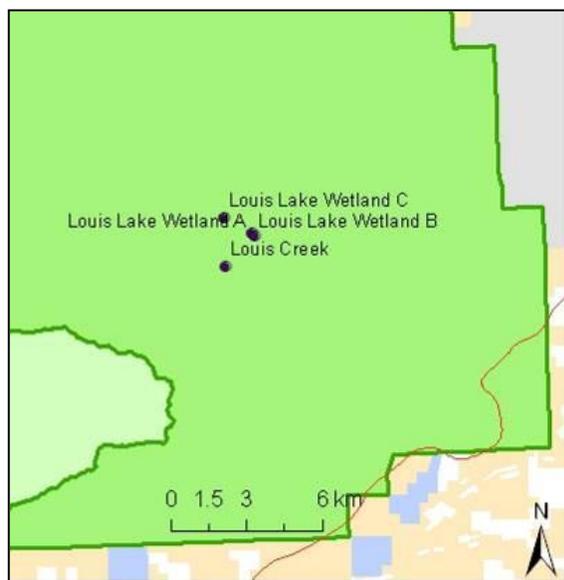
							Physidae	A snail
							Planorbidae	A snail
							<i>Serromyia</i>	A biting midge
							Spheariidae	Fingernail clam
							<i>Sympetrum</i>	Skimmer dragonfly
							<i>Tabanus/Whitneyomyia/Alylotus</i>	Horse and deer flies
Camp Creek Swamp	5	6840	T	25-Jun-09	No		Not sampled	
Lily Lake	5	7680	AA G SM	23-Jun-09	Yes		Not sampled	
Mud Fen_5	5	7700	G FM SM	23-Jun-09	No		Not sampled	
							Acari	A mite
							<i>Aedes</i>	A mosquito
							<i>Bezzia/Palpomyia</i>	Biting midge
							<i>Chaoborus</i>	Phantom midge
							Chironomidae	Non-biting midge
Clay Fen A_5	5	8980	G FM SL	25-Jun-09	No		Cladocera	Water flea
							Melridae/Staphylinidae	Beetle
							<i>Mochlonyx</i>	Phantom midge
							Oligochaeta	Worm
							Spheariidae	Fingernail clam
							<i>Sympetrum</i>	Darter Dragonfly
							<i>Aedes</i>	A mosquito
Meadow_5	5	9560	AA G	29-Jun-09	No		<i>Agabus</i>	Predaceous diving beetle
							<i>Bezzia/Palpomyia</i>	Biting midge
							Chironomidae	Non-biting midge

<i>Dicranota</i>	Crane fly
Nematoda	Nematode
Oligochaeta	Worm
<i>Somatochlora</i>	Emerald dragonfly
Spheariidae	Fingernail clam

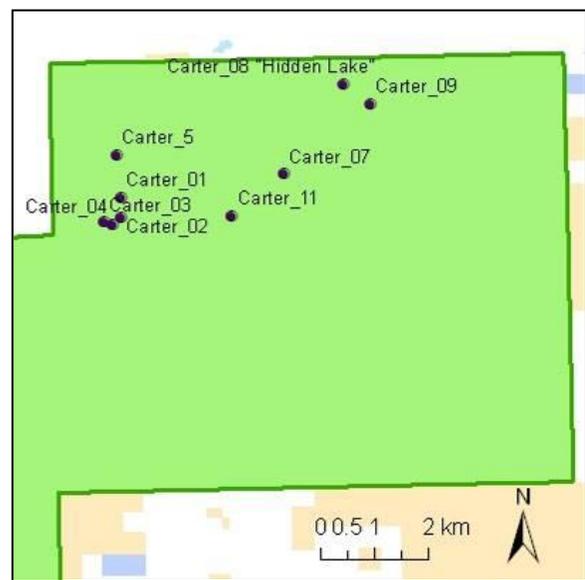
SITE OVERVIEW



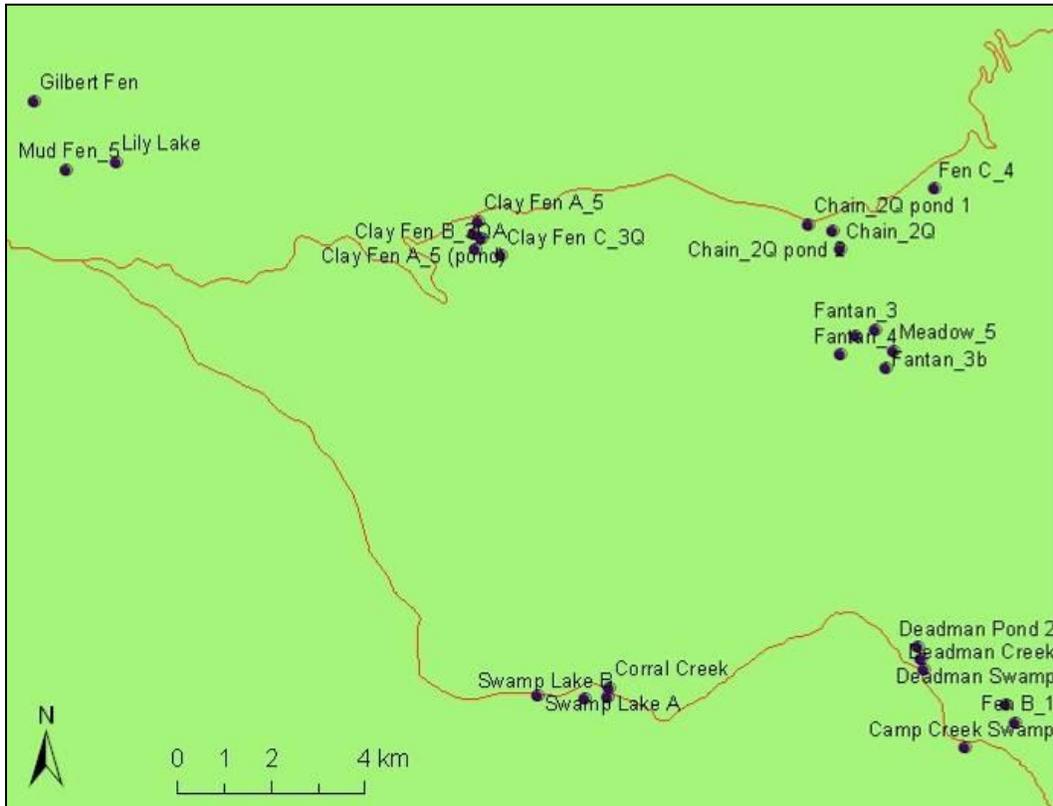
Louis Lake Area



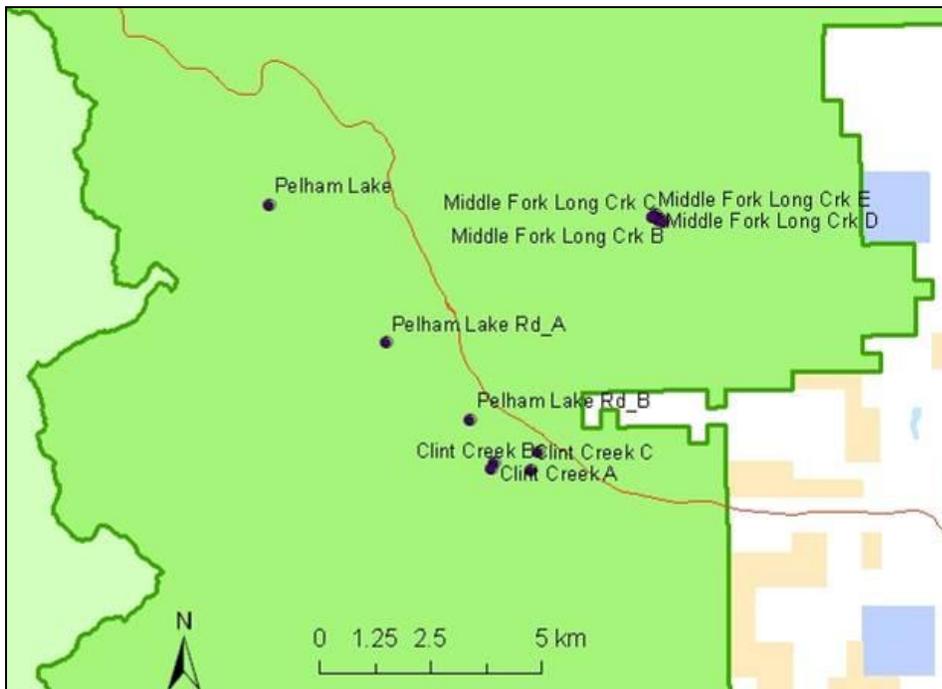
Carter Mountain Area



Northern Fen Area

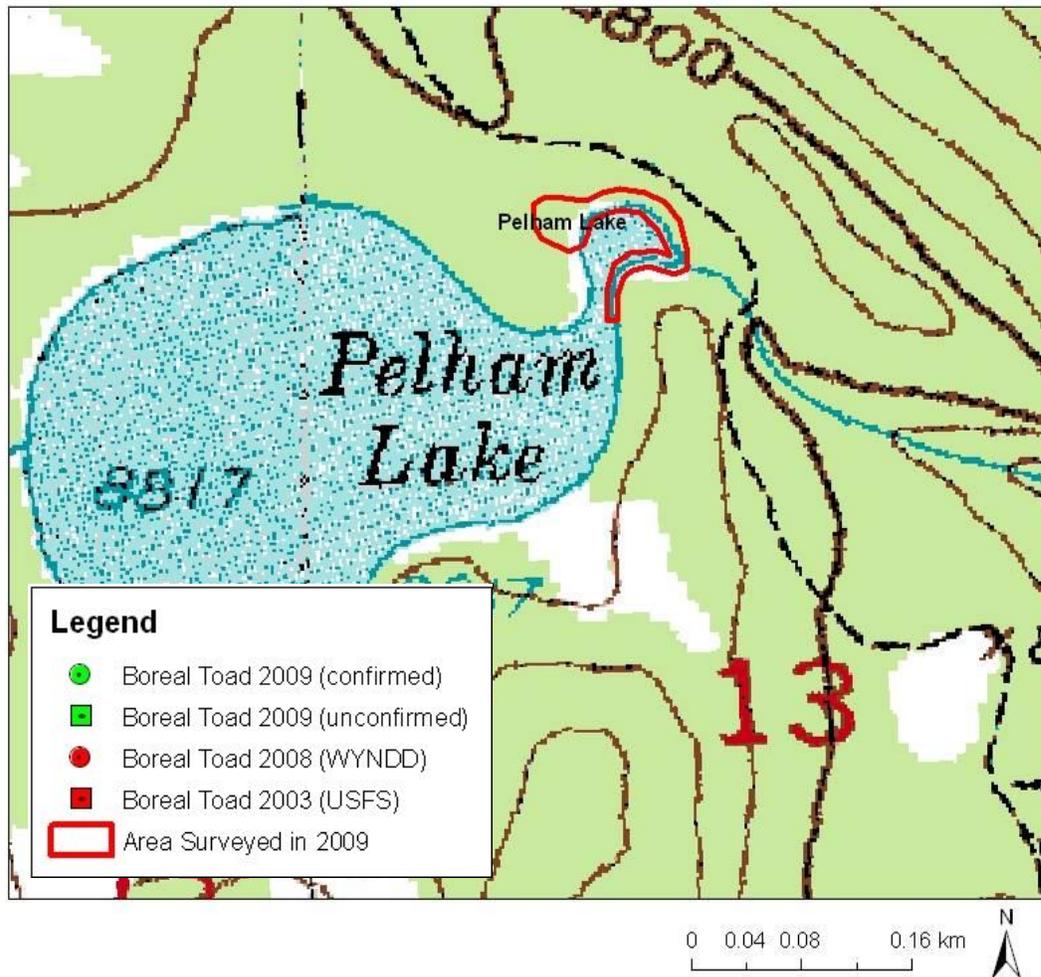


Wind River Area



SITE RESULTS

Pelham Lake



Site: Pelham Lake Outlet

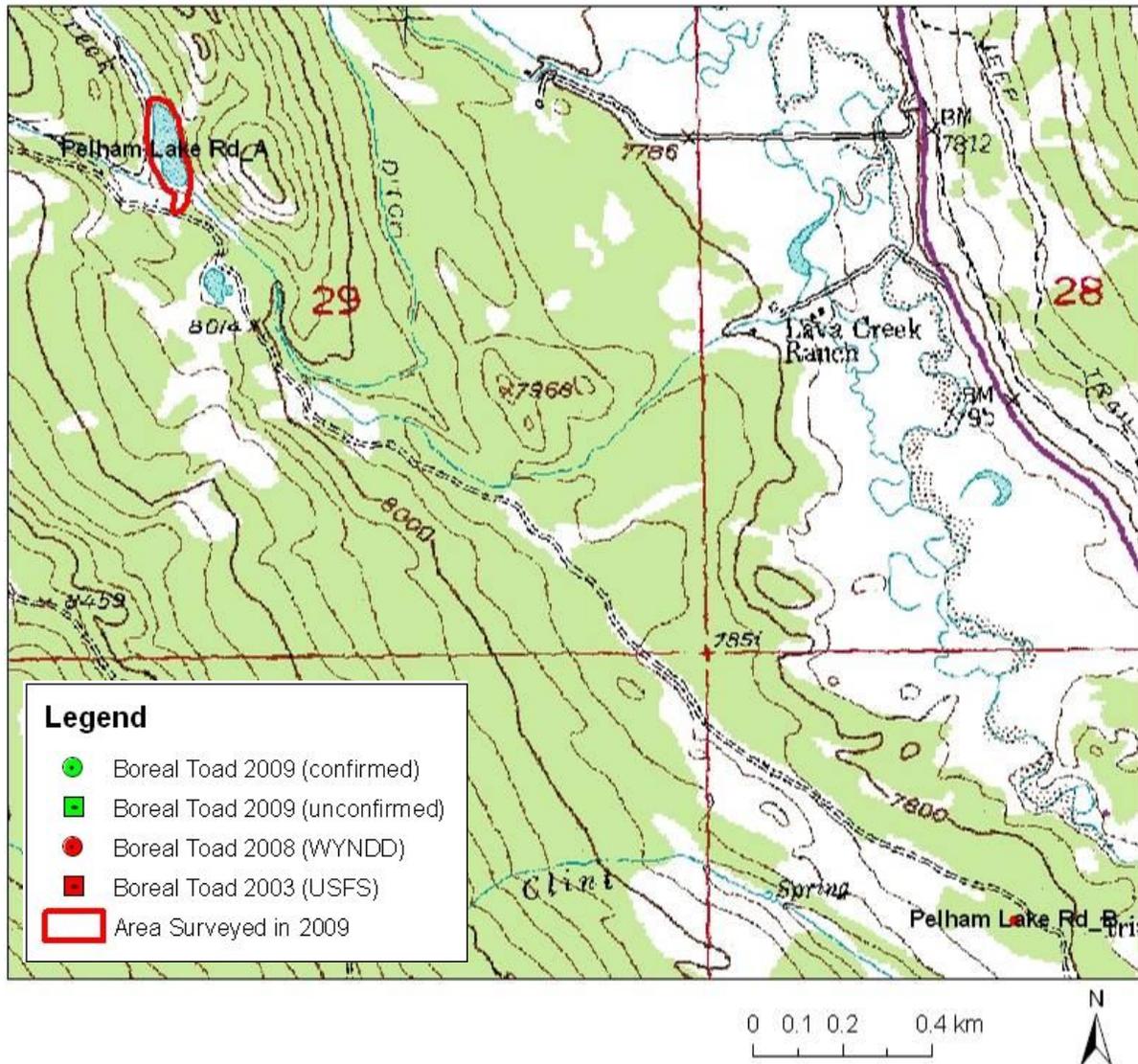
Date: 15 June 2009

Observations: One adult Spotted Frog was observed on the north site of the outlet. One Spotted Frog (likely) or Northern Leopard Frog egg mass was found floating near the adult Spotted Frog.

Search Notes: *Effort:* 100 person-minutes of survey. *Weather:* Air temperature was ~58°F with partly cloudy skies and light wind.

Habitat Notes: The shoreline of Pelham Lake consists primarily of abrupt banks with little emergent vegetation. Thus, survey effort targeted the backwaters and wetland areas near the outlet on the NE side of the lake. Some emergent vegetation was present in these areas and surrounding over-story was primarily conifer forest. Pelham Lake reportedly contains fish.

Pelham Lake Road



Site: Pelham Lake Road (Sites A & B)

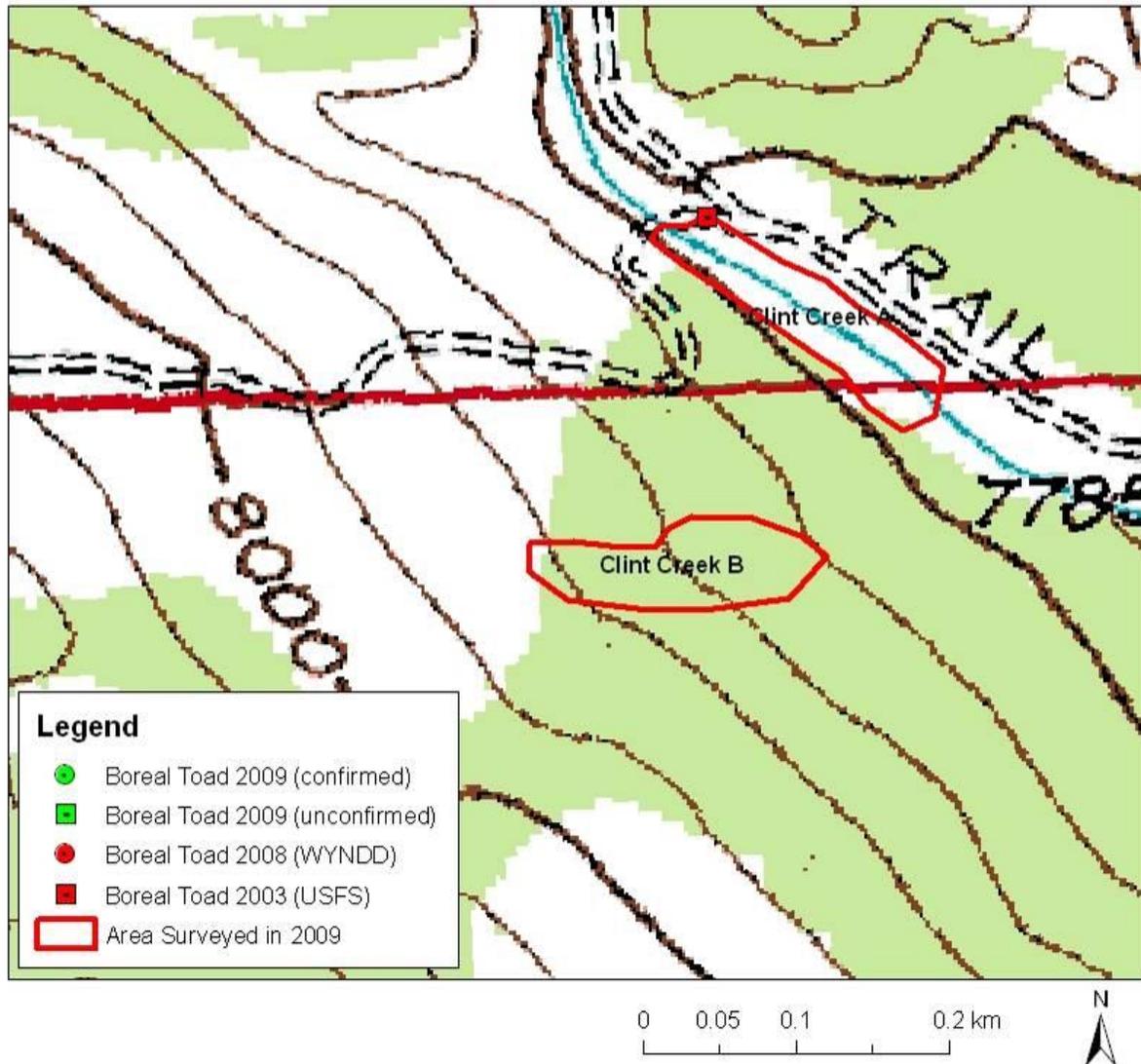
Date: 15 June 2009

Observations: Site A contained 3 adult Spotted Frogs and ≤ 100 Spotted Frog tadpoles. One Boreal Chorus Frog was also heard. No amphibians were observed at Site B.

Search Notes: Both sites were opportunistic search. *Effort:* ~96 person-minutes of survey in Site A and ~11 person-minutes of survey in Site B. *Weather:* Air temperature was ~60°F with partly cloudy skies and light wind.

Habitat Notes: Site A was likely a permanent marsh filled by springs and snow-melt. Site likely does not contain fish. Some emergent vegetation was present. Site B was a temporary shallow puddle with no fish and some emergent vegetation present.

Clint Creek



Site: Clint Creek (Sites A & B)

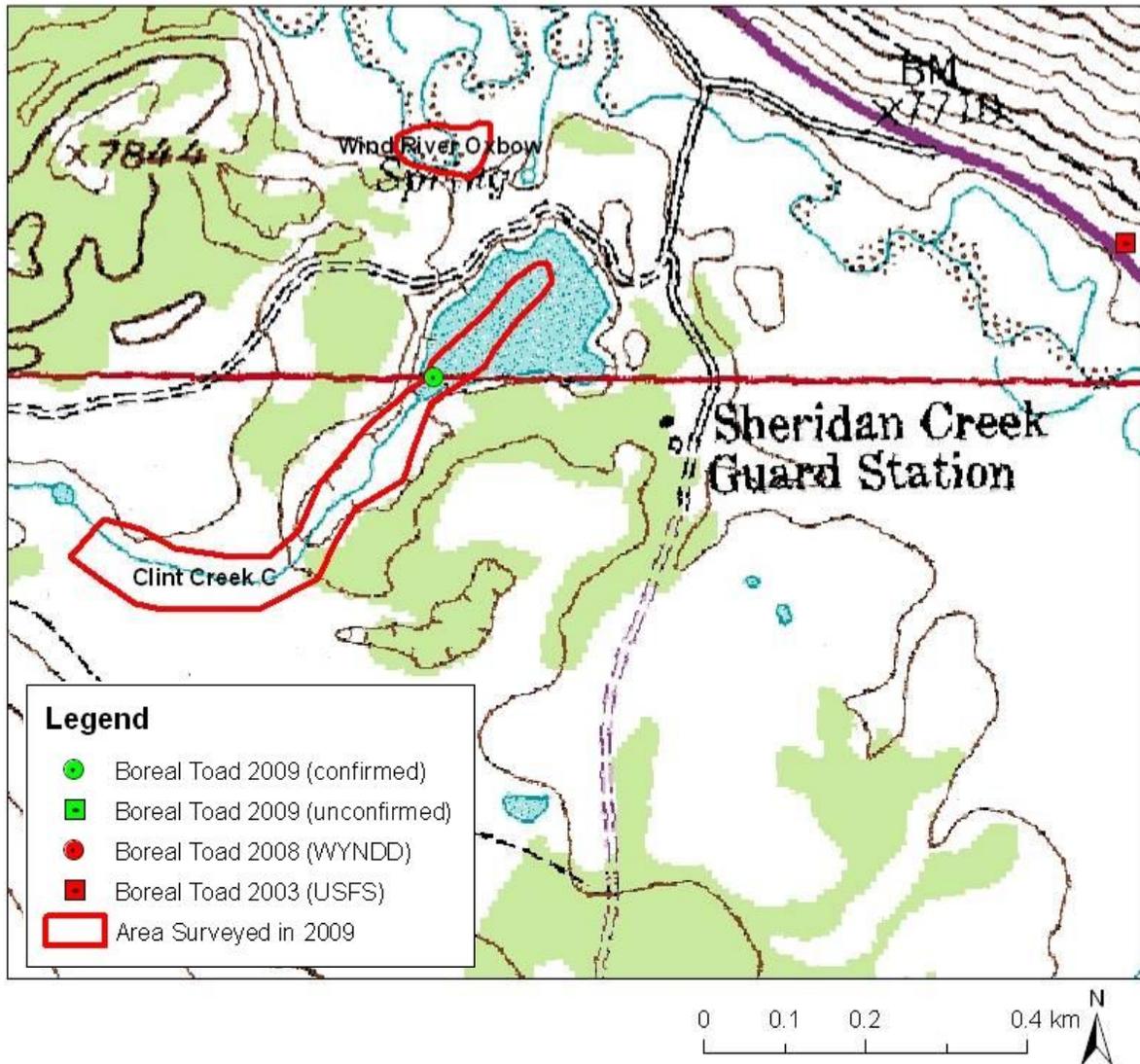
Date: 15 June 2009

Observations: Five adult Boreal Chorus Frogs, 8 juvenile Spotted Frogs, and 2 adult Spotted Frogs were observed.

Search Notes: *Effort:* ~ 100 person-minutes at both Site A & B (200 total person-minutes).
Weather: Air temperature was ~48°F with partly cloudy to overcast skies and light wind.

Habitat Notes: Site A was along Clint Creek in a wide but shallow, flooded stretched with lots of slow-moving and still water, willows, and emergent vegetation (primarily sedges and grasses). An oily sheen was seen in backwater areas in some spots. Site B was a wet meadow likely fed by springs and snow-melt. The site was primarily open but surrounded by conifer forest.

Clint Creek



Site: Clint Creek (Site C)

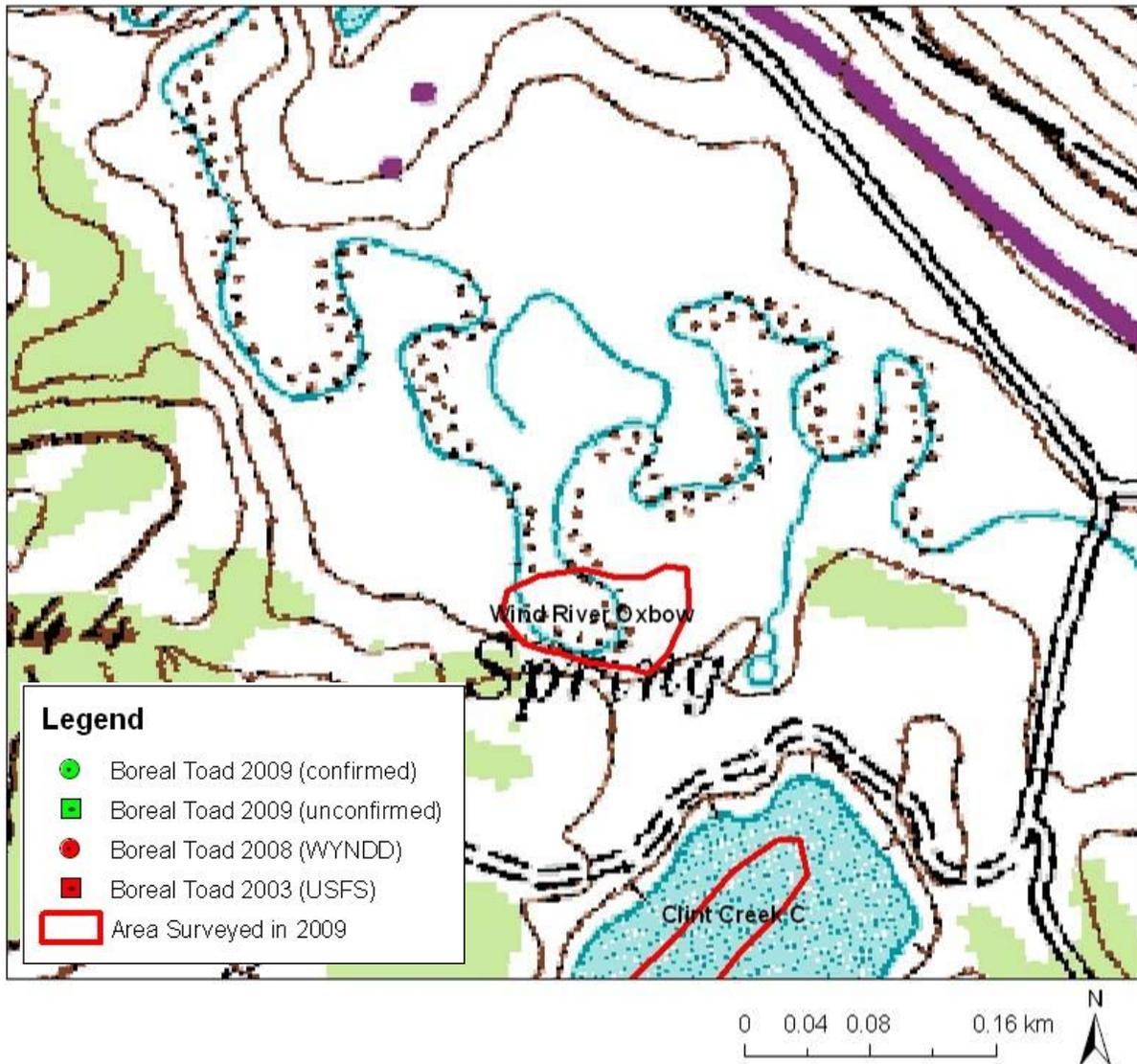
Date: 15 June 2009

Observations: One adult male Boreal Toad (Snout-vent length = 7.7 cm) found in wet meadow next to small stream just below dam. Nine adult Boreal Chorus Frogs found in marshy areas along stream channel above dam.

Search Notes: *Effort:* ~260 person-minutes of survey. *Weather:* Air temperature was ~51°F with partly cloudy skies and light wind.

Habitat Notes: Reservoir at northern end of Clint Creek was dried up with only marshy/wet meadow sections surrounding the stream channel below the dam. Above the dam were shallow pools along the stream channel surrounded by willows and riparian vegetation. Lots of flooded backwater and emergent vegetation present above the dam.

Wind River Oxbow



Site: Wind River Oxbow

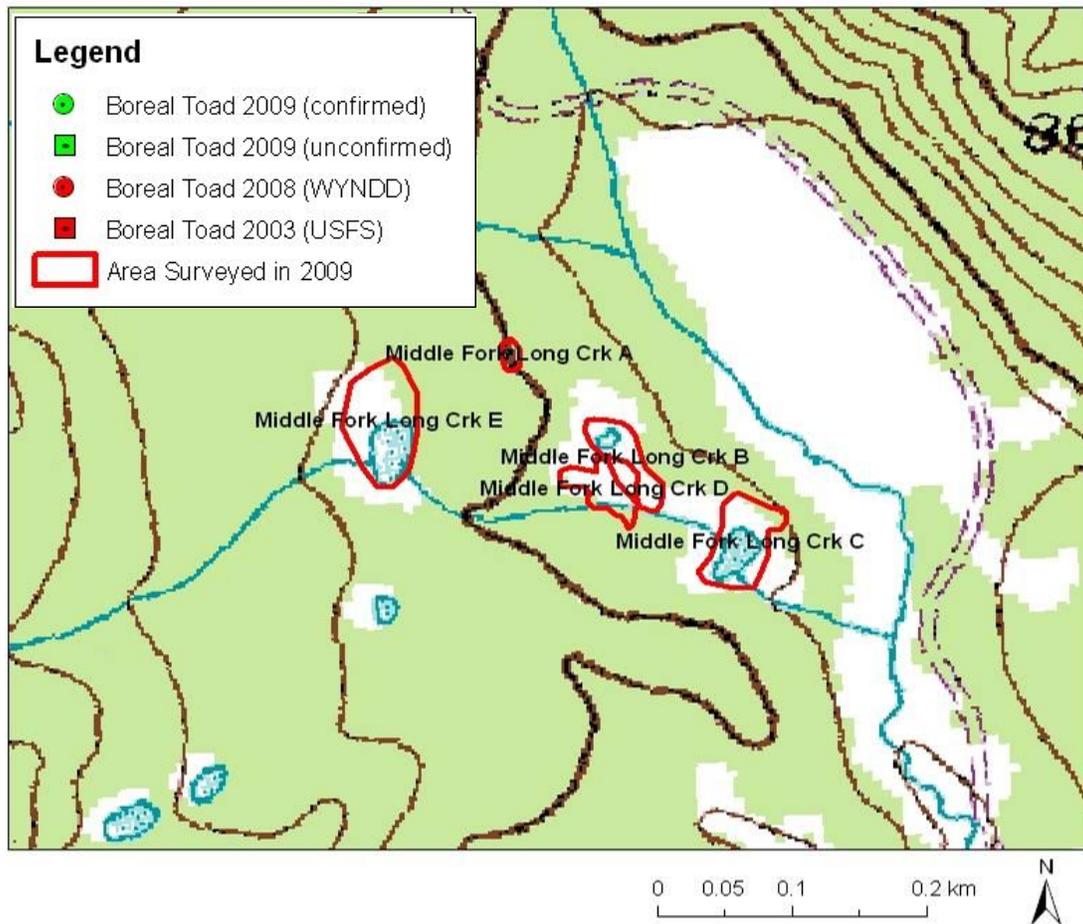
Date: 15 June 2009

Observations: We observed several Boreal Chorus Frog tadpoles and 16 adults, 2 juvenile Spotted Frogs, and 1 unidentified amphibian.

Search Notes: *Effort:* ~144 person minutes of survey. *Weather:* Air temperature was ~60°F with partly cloudy skies and light wind.

Habitat Notes: The survey area consisted of several oxbows and flooded marshy areas along the Wind River. Much of the area was wet, braided with many small channels, and contained willows and lots of emergent vegetation.

Middle Fork Long Creek



Site: Middle Fork Long Creek (Sites A-E)

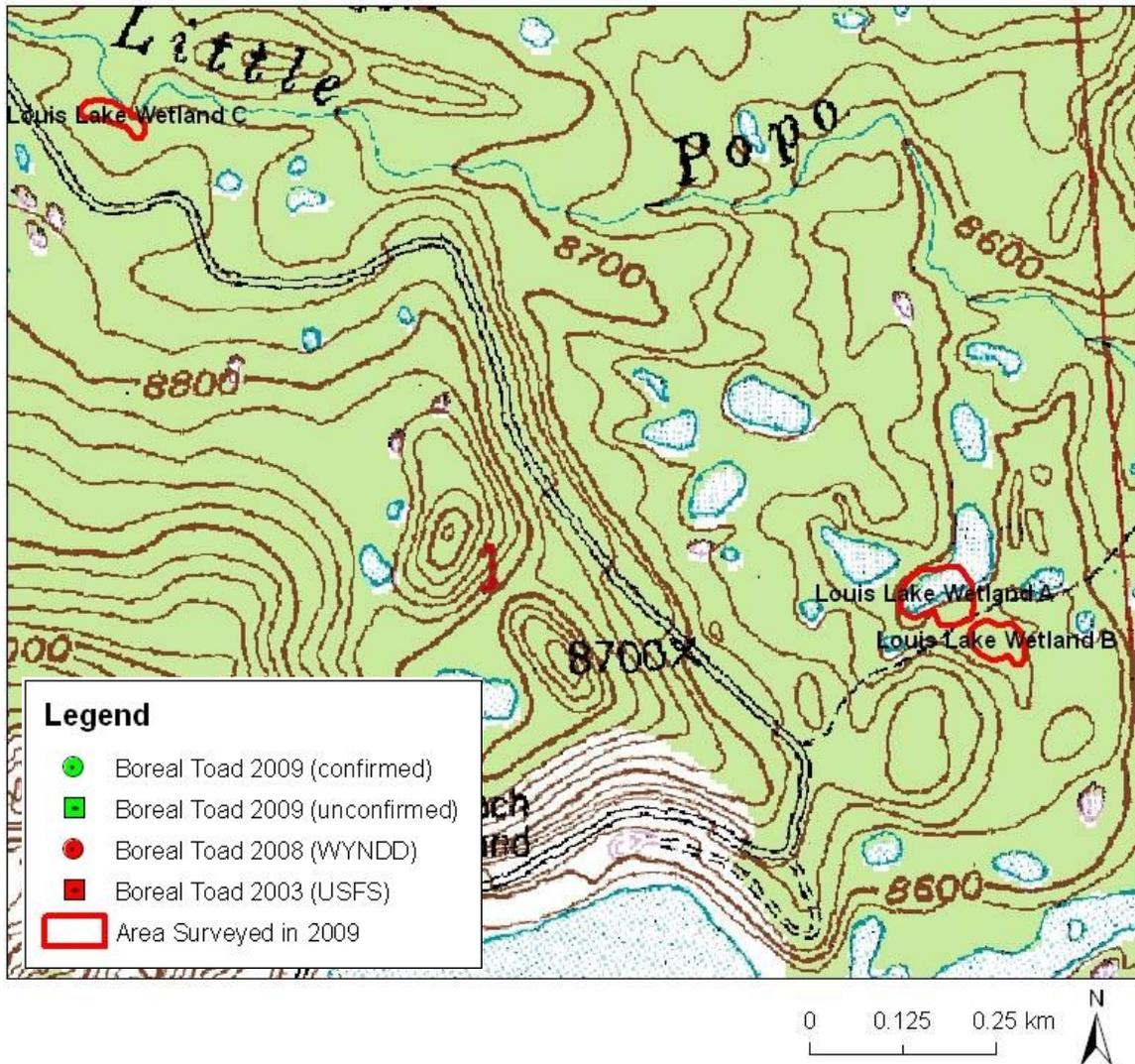
Date: 16 June 2009

Observations: Site A – 1 unknown amphibian detected. Site B – We observed 6 adult Boreal Chorus Frogs. Site C – We observed 6 adult Boreal Chorus Frogs, ≤ 100 likely Boreal Chorus Frog tadpoles (based on lab dissection), 2 confirmed Spotted Frogs, and 1 unconfirmed Spotted Frog. Site D – We observed 5 adult Boreal Chorus Frogs. Site E – No amphibians observed.

Search Notes: *Effort:* ~11 person-minutes of survey at Site A, ~12 person-minutes at Site B, ~80 person-minutes at Site C, ~48 person-minutes at Site D, and ~44 person-minutes at Site E. *Weather:* Air temperature was 65°F with partly cloudy skies and light wind.

Habitat Notes: Survey sites were all ponds or marshes of varying permanence containing varying amounts of emergent vegetation. Several sites were shaded by conifer trees and contained lots of decomposing pine needles. No fish were observed. Site C was the most promising as Boreal Toad habitat (open canopy, lots of emergent vegetation). Site E had a very nice wetland/marshy area on the north side of the pond but no amphibians were seen or heard.

Louis Lake Wetlands



Site: Louis Lake Wetlands (Sites A-C)

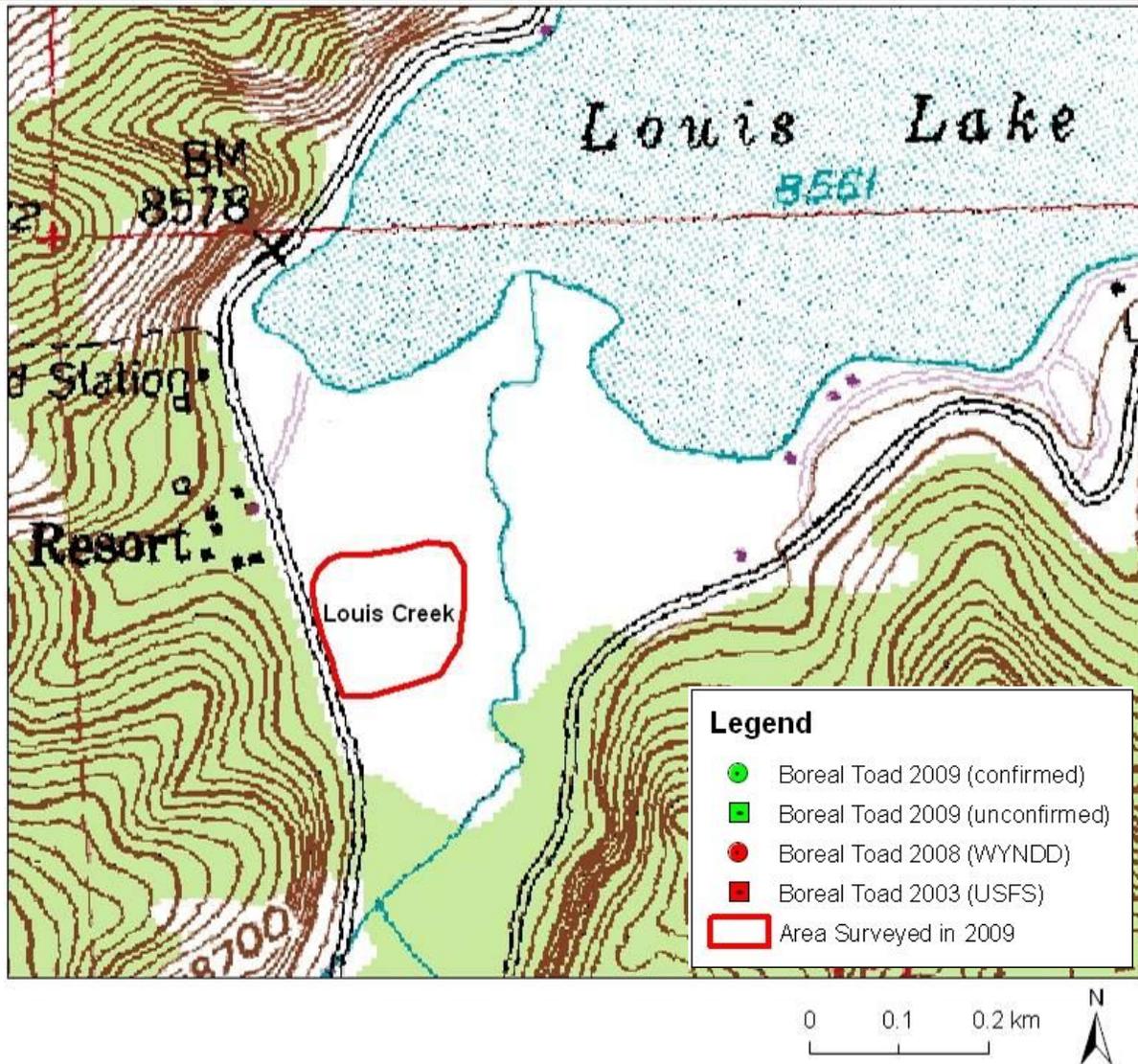
Date: 17 June 2009

Observations: We observed 1 unknown amphibian at Site A. No amphibians were observed at Sites B & C.

Search Notes: *Effort:* 66 person-minutes of survey at site A, 48 person-minutes at Site B, 34 person-minutes at Site C. *Weather:* Air temperature was 45°F with partly cloudy to overcast skies and light wind.

Habitat Notes: Sites A & B were ponds with surrounding flooded wetlands and good amounts of emergent vegetation. Sites appeared to be excellent habitat for amphibians but few were observed. Site C was an oxbow/wet meadow adjacent to the Little Popo Agie River with lots of small braided channels and emergent vegetation in the form of flooded tussocks of grasses.

Louis Creek



Site: Louis Creek

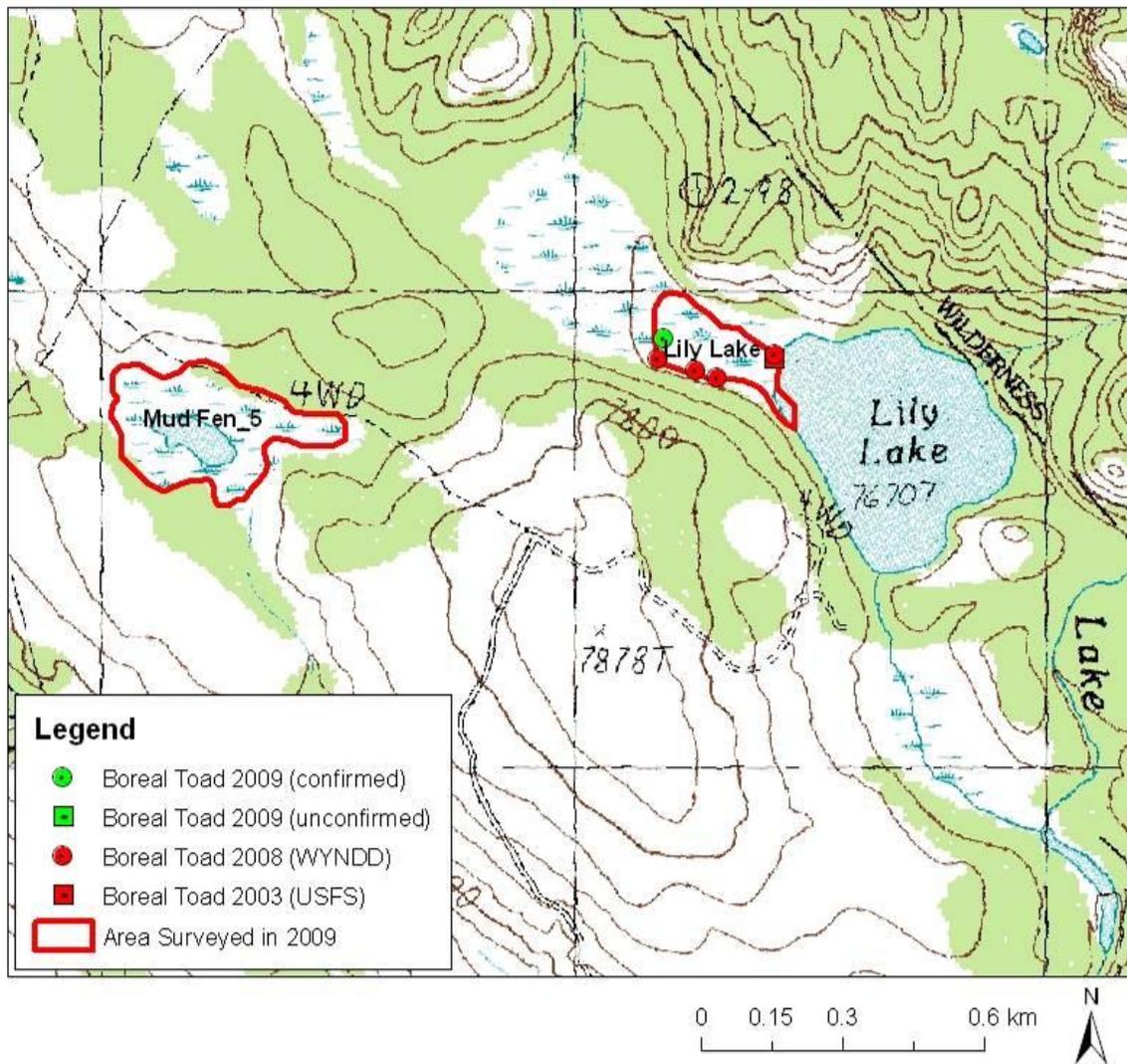
Date: 15 June 2009

Observations: No amphibians detected.

Search Notes: *Effort:* ~60 person-minutes of survey. *Weather:* Air temperature was 52°F with partly cloudy skies and light wind.

Habitat Notes: Site was primarily wetlands at the inlet of Louis Creek into Louis Lake. Wetlands were laced with braided stream channels and small ponds. Lots of willows and riparian vegetation were present along with emergent vegetation (primarily grasses).

Lily Lake & Mud Fen



Site: Lily Lake & Mud Fen_5

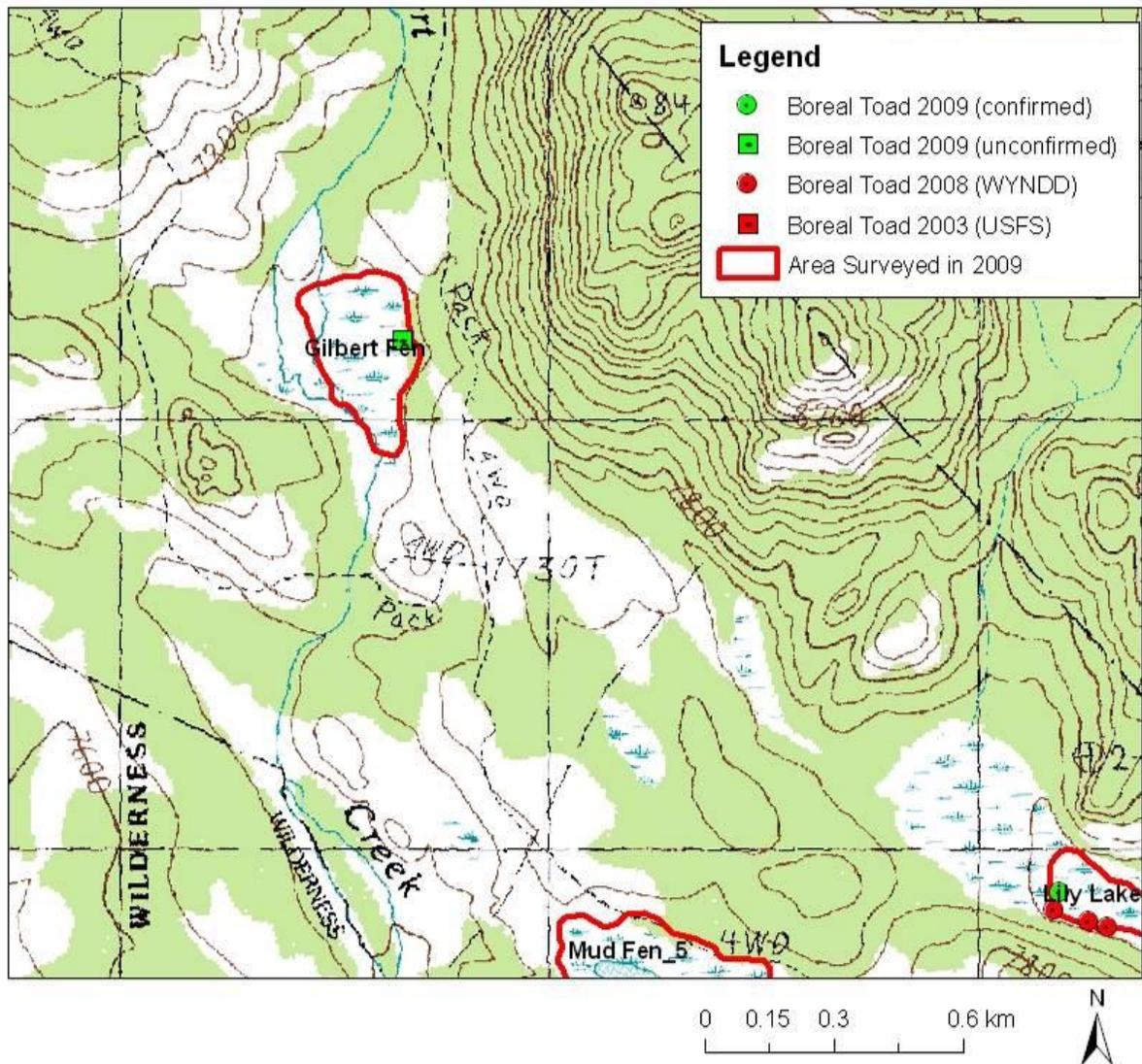
Date: 23 June 2009

Observations: One smallish adult Boreal Toad observed in open water near sedges at the fen on the NW side of Lily Lake. No amphibians observed at Mud Fen_5.

Search Notes: *Effort:* 190 person-minutes of survey at Lily Lake and 117 person-minutes of survey at Mud Fen_5. *Weather:* Air temperature was 65°F with clear skies and light wind at Lily Lake. Temperature rose to ~77°F and winds became moderate at the Mud Fen_5 survey.

Habitat Notes: Marsh/wetland on NW side of Lily Lake contained willows, emergent vegetation (primarily sedges with some grass and water lilies), patches of open water, and some fast flowing channels. Mud Fen_5 was surrounded by relatively deep wetlands with lots of sedges and few open pools other than the center pond.

Gilbert Fen



Site: Gilbert Fen

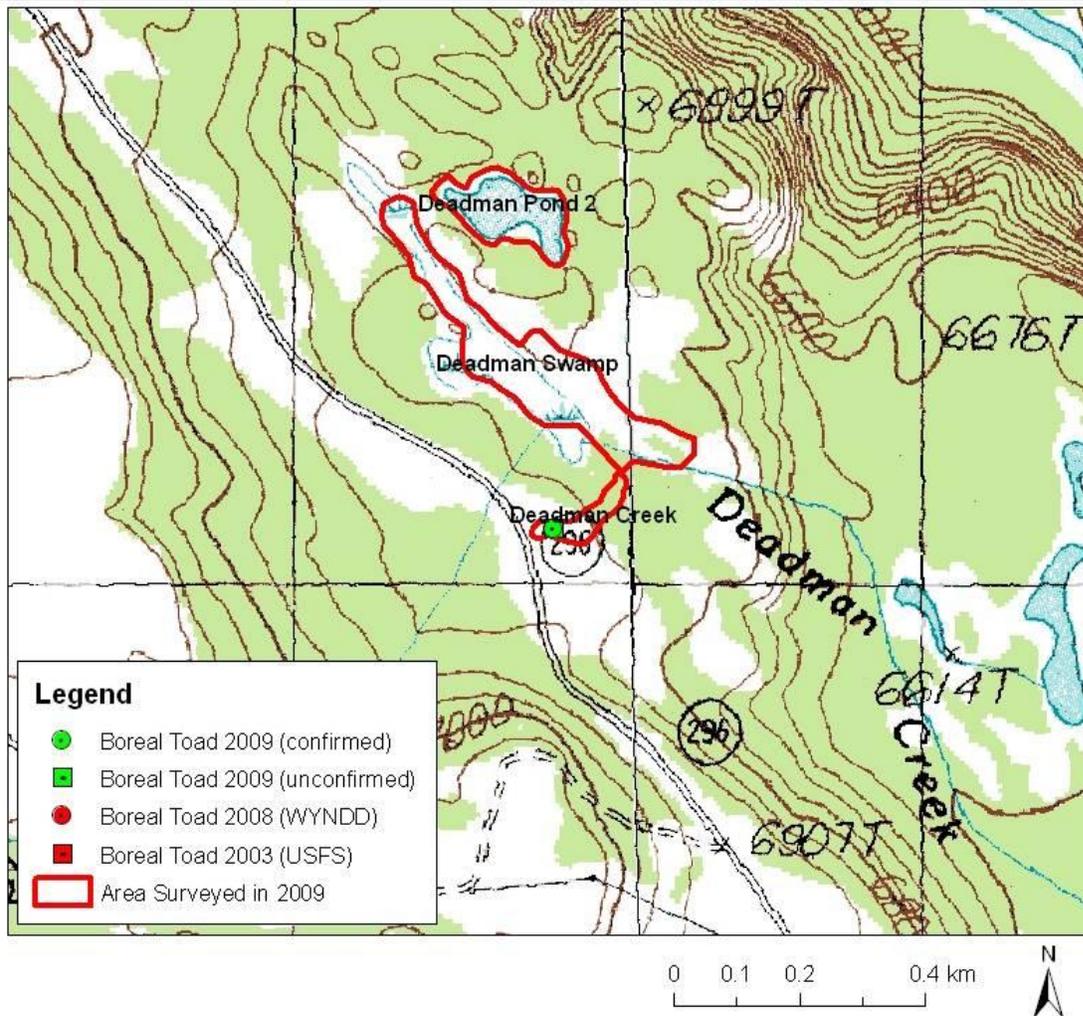
Date: 24 June 2009

Observations: Three unknown amphibians observed, one of which was a possible Boreal Toad.

Search Notes: *Effort:* 174 person-minutes of survey. *Weather:* Air temperature was 63°F with clear skies and light wind.

Habitat Notes: Site was composed of a stream channel and surrounding marshes with 65% knee-high shrubs, sedges, and grasses, making the ground difficult to see. Some tall willows were present near moving water and many small conifers were in the bog areas. Open stagnant water covered ~20% of area; other areas were dry or damp. Some water had an oily sheen; some was clouded with iron-colored suspended matter. West side of fen had multiple fast-flowing channels. Fish were present (trout?).

Deadman Creek



Site: Deadman Creek, Deadman Swamp, Deadman Pond 2

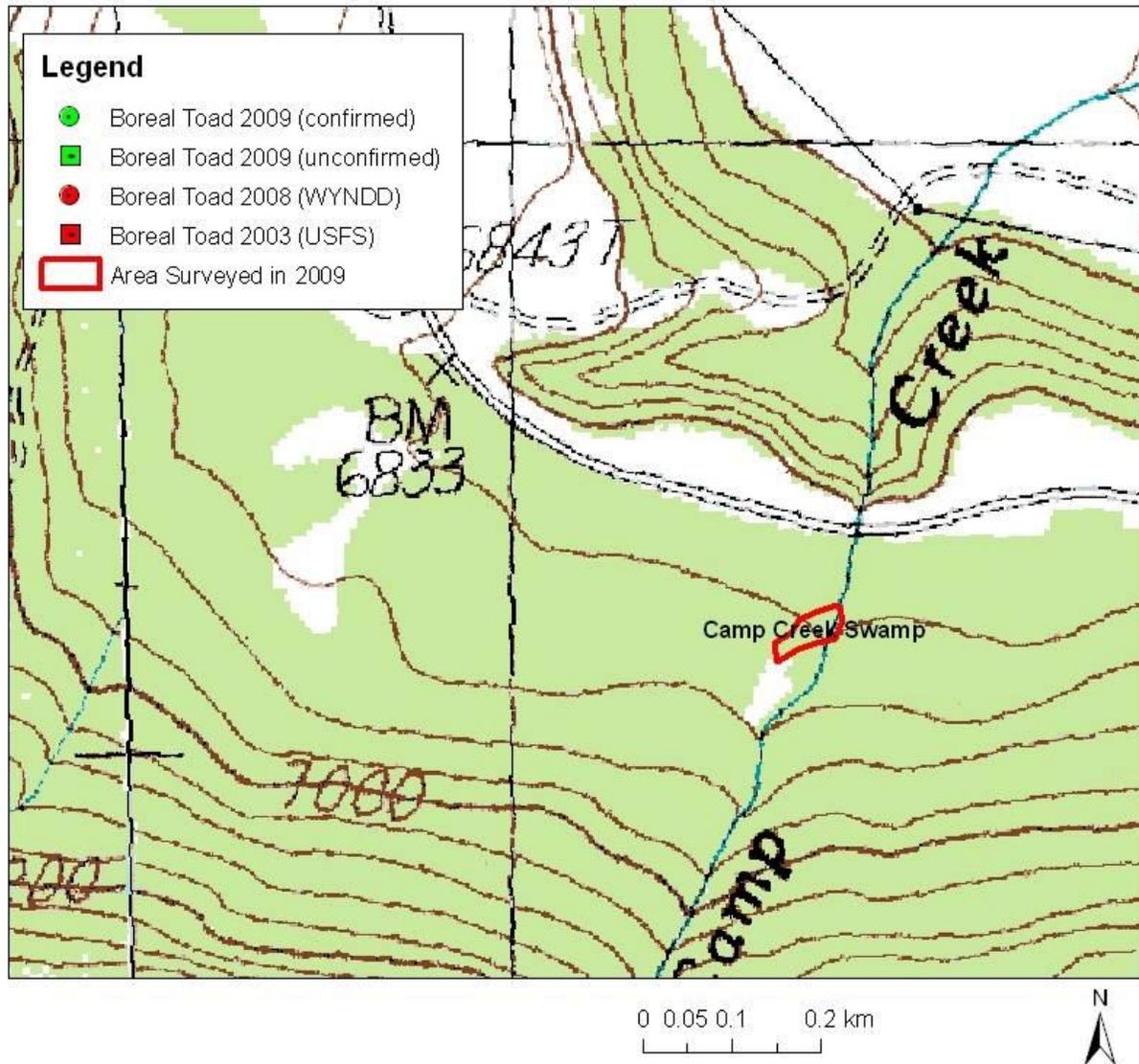
Date: 25 June 2009

Observations: 32 confirmed Boreal Toad metamorphs (toadlets) and 1 unconfirmed adult were observed opportunistically alongside a stream (Deadman Creek) that passed under the road and lead down to Deadman Swamp. Toadlets were in calm, moist areas on the edge of the stream, typically in open areas with sand/mud/gravel substrate. No amphibians were observed at Deadman Swamp and only 1 unidentified amphibian was observed at Deadman Pond 2.

Search Notes: Effort: 50 person-minutes of survey at Deadman Creek; 94 person-minutes at Deadman Swamp; 80 person-minutes at Deadman Pond 2. Weather: Air temperature was 77°F with clear skies and light wind.

Habitat Notes: Deadman Swamp was primarily filled with sedges with very little open water. Deadman Pond 2 had lots of sedges but also open water with cattails. Wetlands often too deep to search. Voles, ducks, and a sandhill crane were present.

Camp Creek



Site: Camp Creek

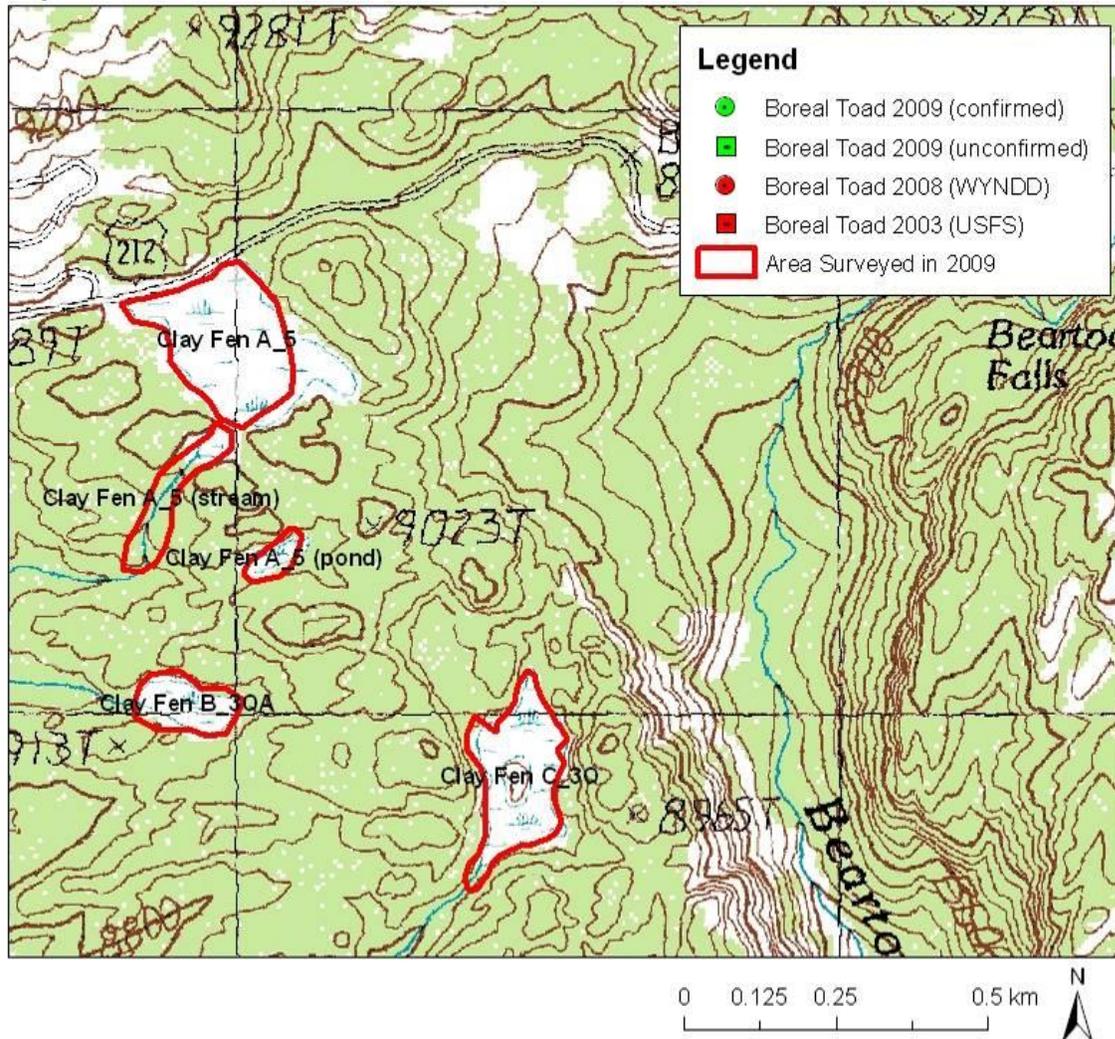
Date: 25 June 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 20 person-minutes of survey. *Weather:* Air temperature was 76°F with clear skies and light wind.

Habitat Notes: This site was in an ephemeral stream with surrounding marsh. Most of the area was covered moist ground but no visible standing water. Some boggy areas on the perimeter were very dry but looked like they may have been wetter in the past. Small open clearing near the creek, otherwise heavily forested. Not promising Boreal Toad habitat.

Clay Fens



Site: Clay Fen A_5, Clay Fen B_3QA, Clay Fen C_3Q

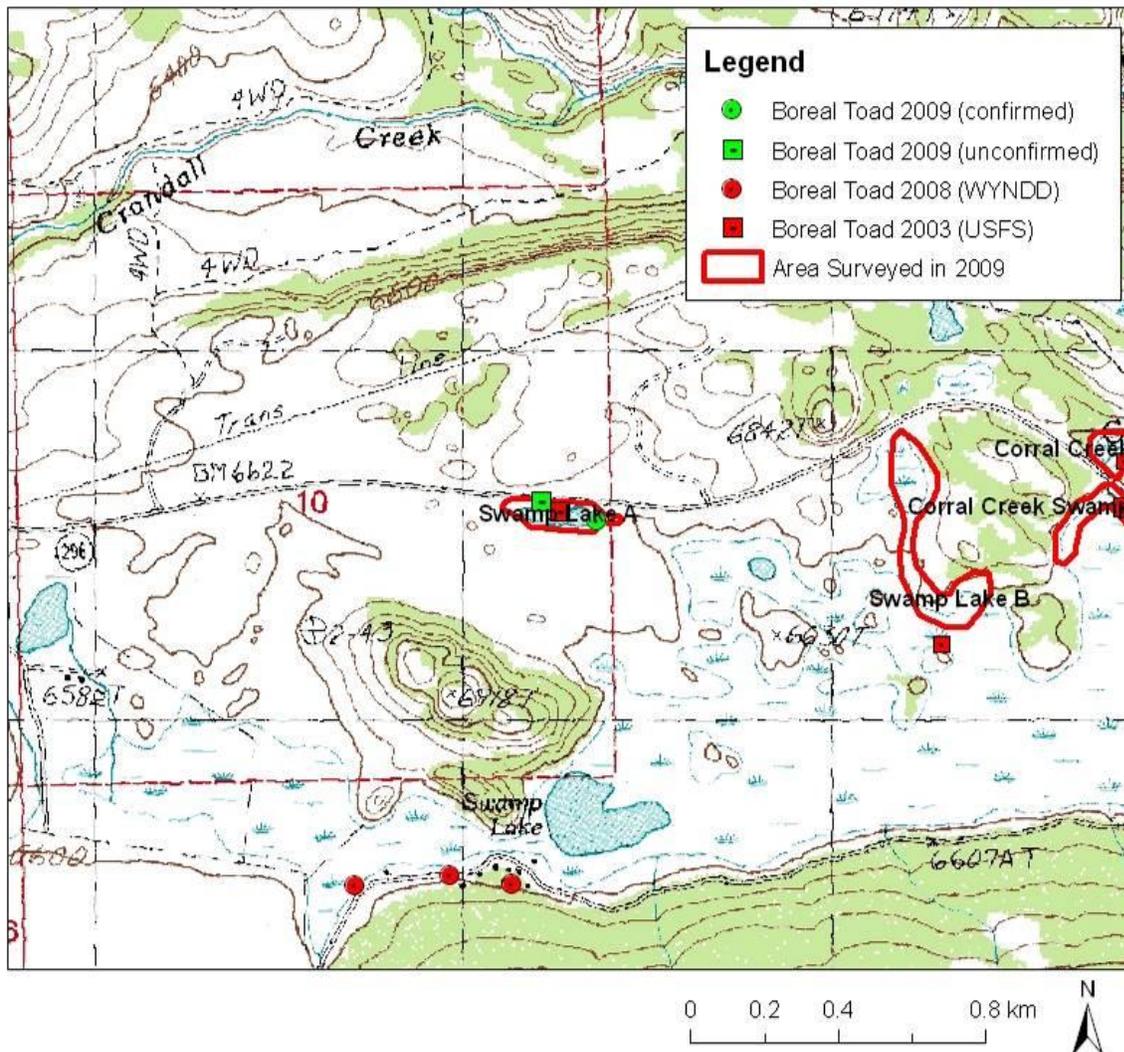
Date: 25-26 June 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 92 person-minutes of survey at Clay Fen A_5; 34 person-minutes at Clay Fen B_3QA; ~80 person-minutes at Clay Fen C_3Q. *Weather:* 25 June 2009 – Air temperature was 79°F with partly cloudy skies and light wind. 26 June 2009 – Air temperature was 55-60°F with overcast skies.

Habitat Notes: Clay Fen A_5 had a deep central open water area with floating grass mats surrounded by a marshy area with willows and sedges. Clay Fen B_3QA was a marsh comprised mainly of willows and sedges with no open water. Clay Fen C_3Q was a marsh with lots of willows, some sedges and grasses, and no open water.

Swamp Lake



Site: Swamp Lake

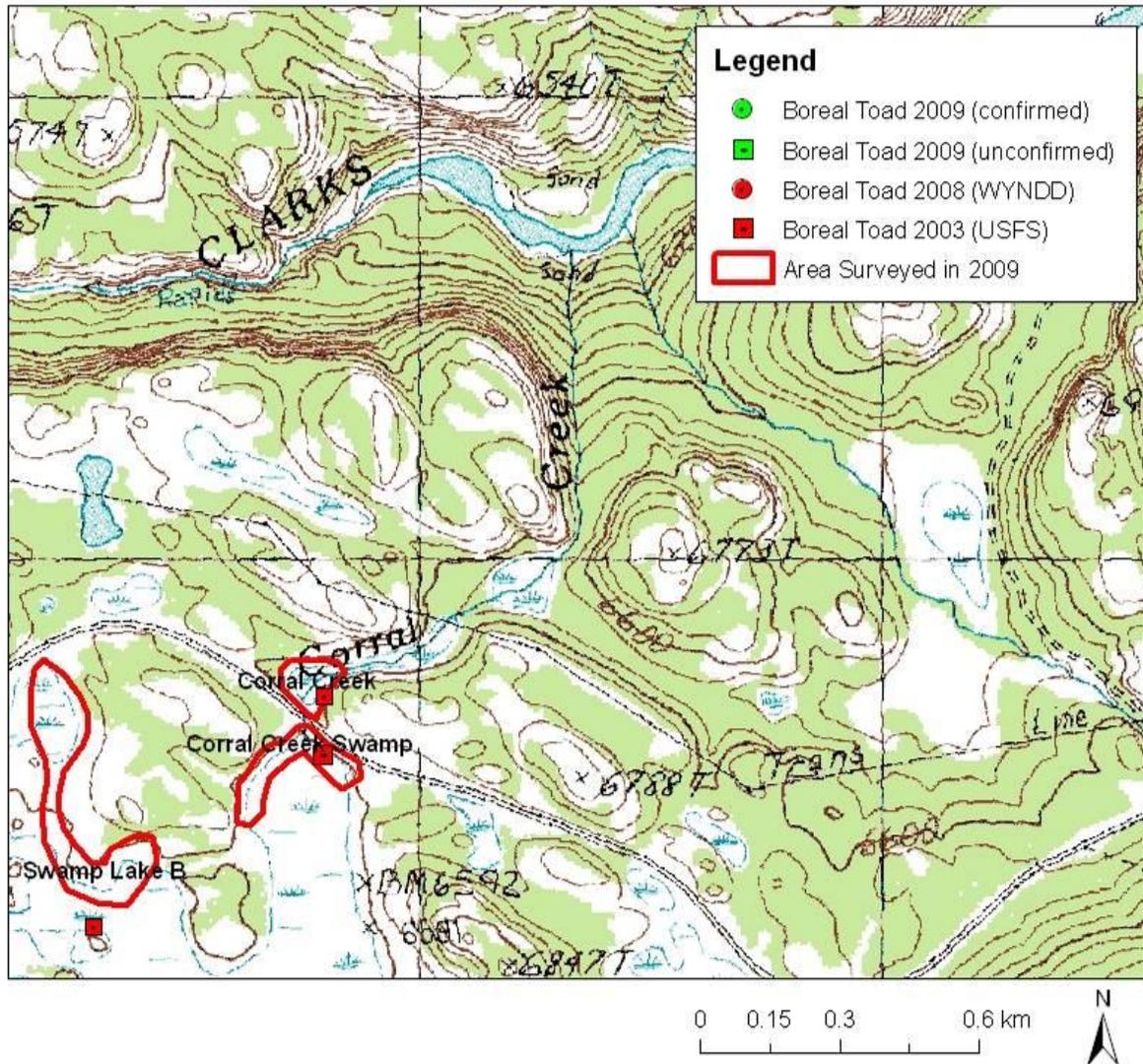
Date: 30 June 2009

Observations: One confirmed and 1 probable adult Boreal Toad and 13 Boreal Toad tadpoles observed at small wetland/pond just north of Swamp Lake (Site A). Tadpoles were found on submerged rocks in shallow water. No amphibians observed at Site B.

Search Notes: *Effort:* 60 person-minutes of survey at Site A; only a quick opportunistic survey of Site B was done due to thunder storm. *Weather:* Air temperature was 78°F with overcast skies, some rain, and moderate wind. Thunderstorm moving in.

Habitat Notes: Site A was a large pond with emergent vegetation. Shallows contained grassy and open areas. Much greater diversity of vegetation (sedges, reeds, forbs, grasses) and invertebrates than most of the fens surveyed. Ducks and voles present. Site B was a marshy area with sedges and cattails.

Corral Creek



Site: Corral Creek & Corral Creek Swamp

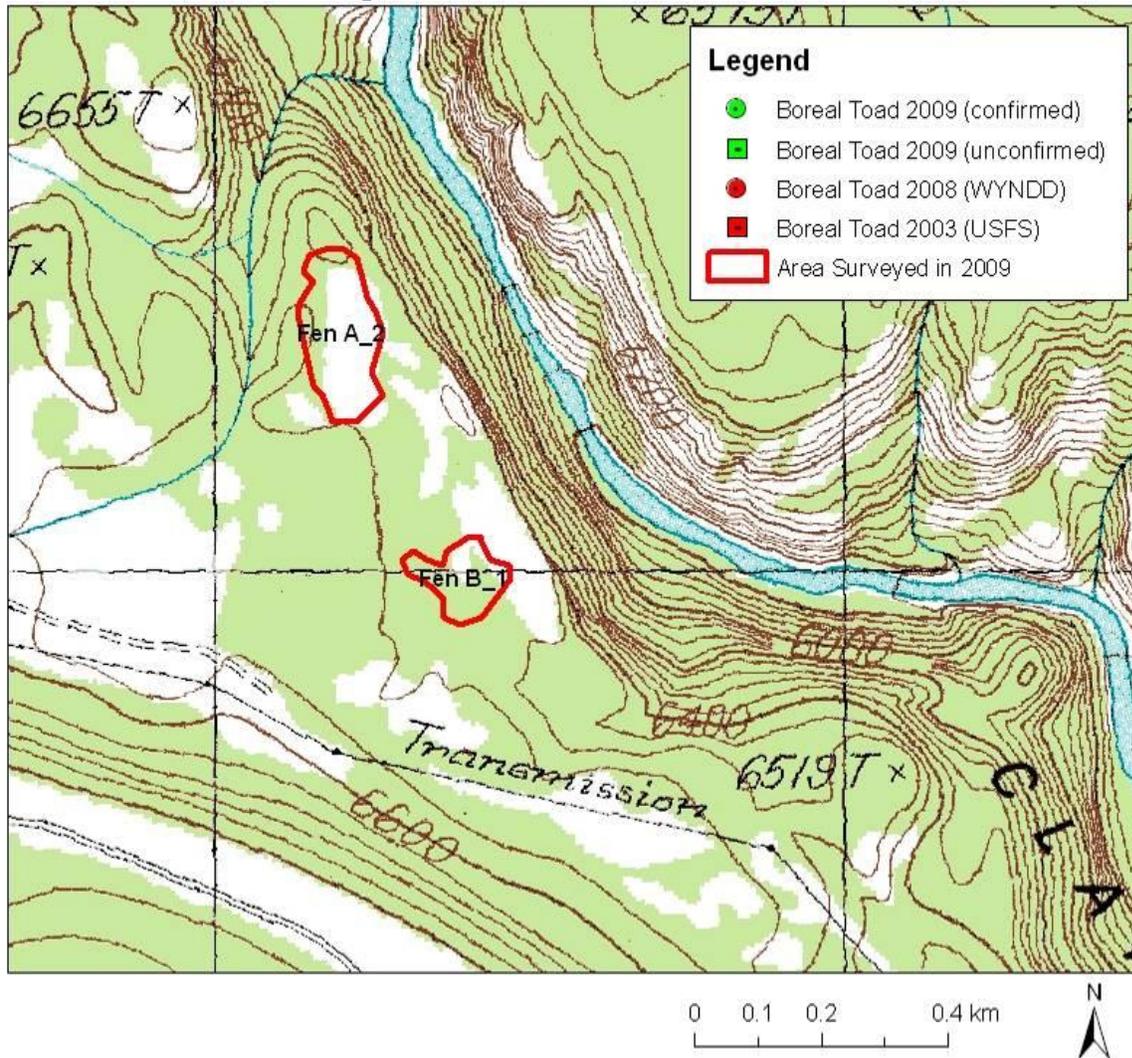
Date: 30 June 2009

Observations: No amphibians were observed at Corral Creek. Three Spotted Frogs were observed at Corral Creek Swamp.

Search Notes: *Effort:* 24 person-minutes of survey at Corral Creek; 33 person-minutes of survey at Corral Creek Swamp. *Weather:* Air temperature was ~73°F with overcast skies and light wind.

Habitat Notes: Corral Creek was a stream channel with neighboring wetlands dominated by tall sedges in semi-deep water. Wetlands contained no open water. The stream was fast moving and filled to the top of the grass/sedge-covered banks. Corral Creek Swamp contained large, deep ponds with cattails surrounded by grassy or rocky banks. No much for shallows.

Fens A & B near Camp Creek



Site: Fen A_2 & Fen B_1

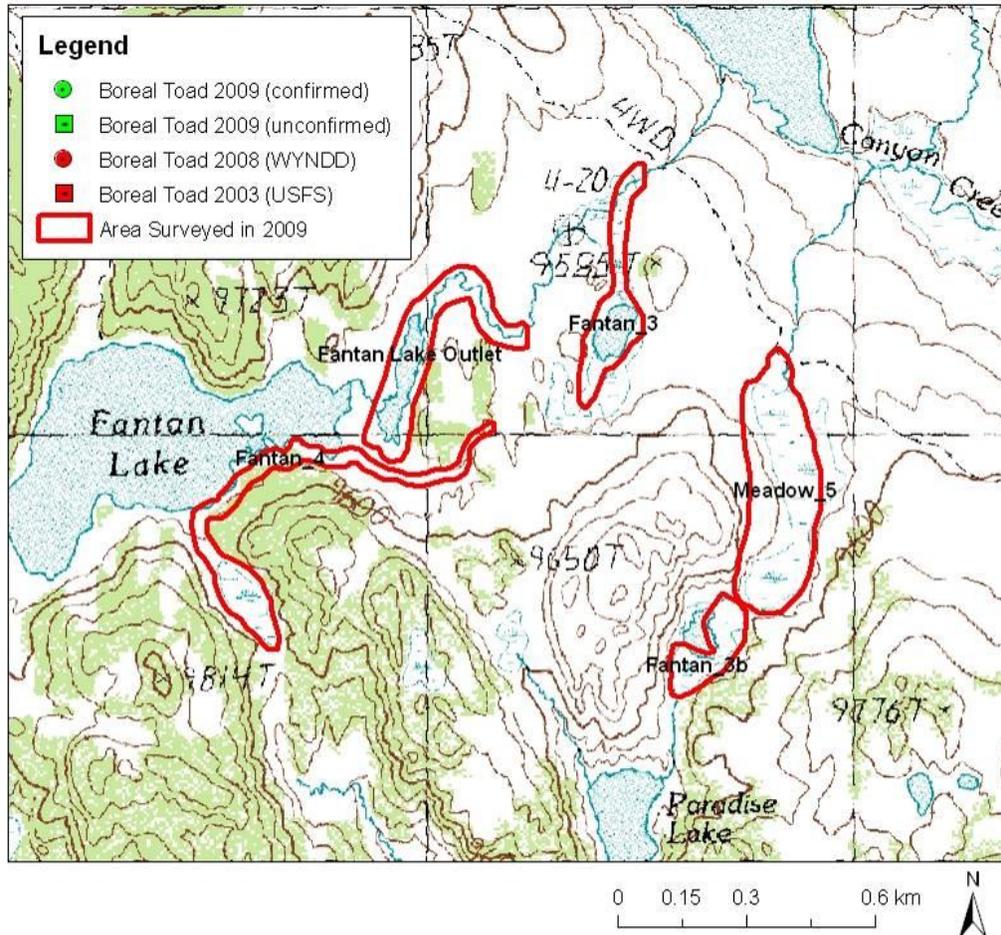
Date: 30 June 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 56 person-minutes of survey at Fen A_2; 28 person-minutes at Fen B_1.
Weather: Air temperature was ~78°F with partly cloudy skies and light wind.

Habitat Notes: Fen A_2 was a large wetland with lots of dead snags, sedges, and some shrubs. Boggy areas contained deep water but no real open water. Fen B_1 was in an ephemeral channel/marsh with lots of trees, mosses, forbs, sedges, and some willows. Parts of the fen were heavily forested with only damp moss as an understory. Other parts were open and grassy. Little moving water present and 40% of the fen was dry.

Fantan Lake



Site: Fantan Lake Outlet, Fantan_3, Fantan_3b, Fantan_4, Meadow_5

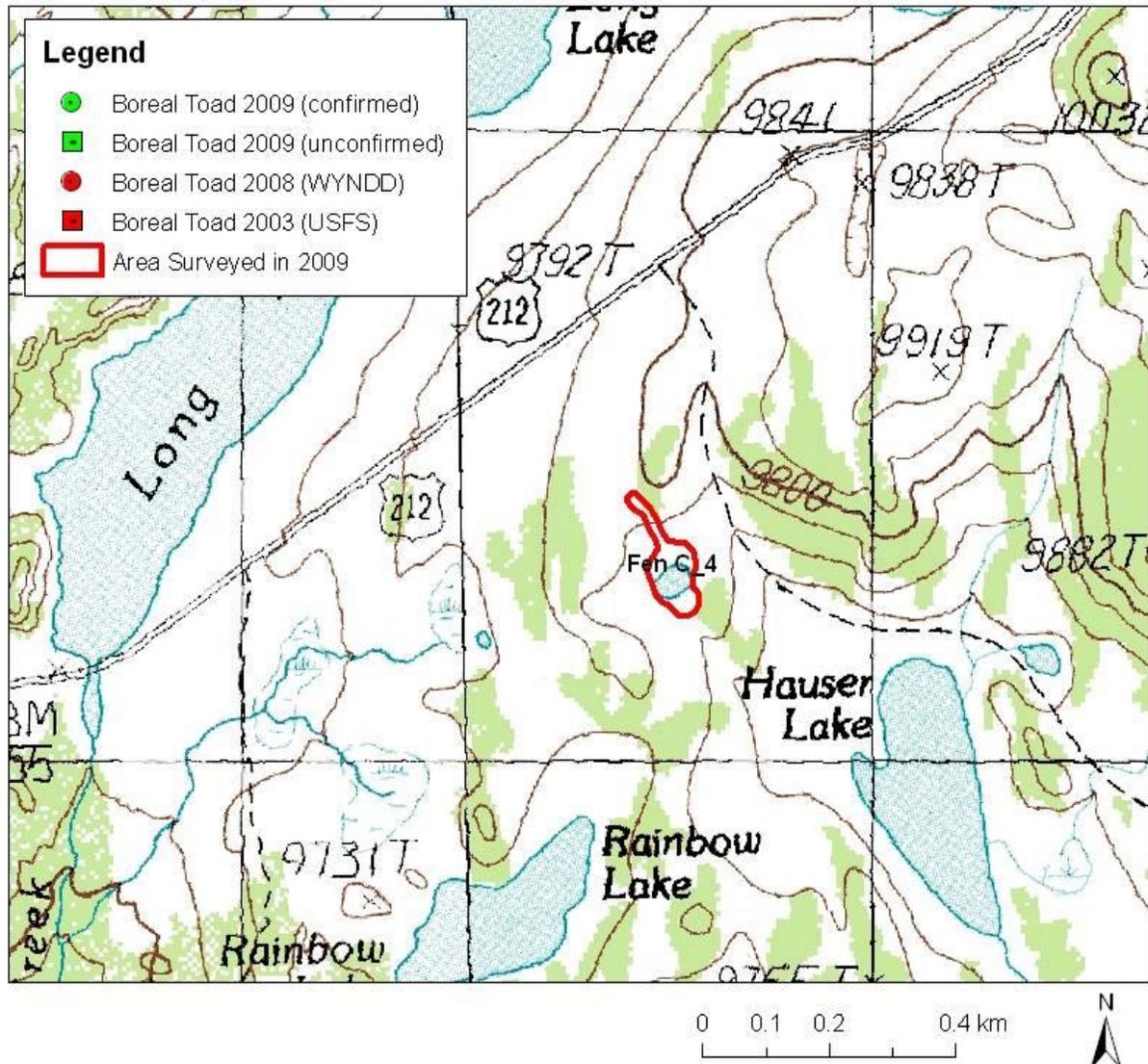
Date: 29 June 2009 & 1 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 32 person-minutes of survey at Fantan Lake Outlet; 38 person-minutes at Fantan_3; 78 person-minutes at Fantan_3b; 38 person-minutes at Fantan_4; 42 person-minutes at Meadow_5. *Weather:* 29 June 2009 - Air temperature was 60-65°F with overcast skies, intermittent rain and hail, and moderate to strong winds; 1 July 2009 was partly cloudy to overcast with light to moderate winds.

Habitat Notes: Fantan Lake Outlet was a stream channel with adjacent wetlands and contained trout. Fantan_3 was an open pond surrounded by marsh land with sedges and some willows. Fantan_3b was a marsh with lots of open ponds with emergent grasses. Fantan_4 was a marsh with emergent sedges, grasses, and forbs, and good shallows at the south end of the marsh. Trout seen in nearby stream. Meadow_5 was a marsh with standing water in channel-like indents dominated by sedges.

Fen C_4



Site: Fen C_4

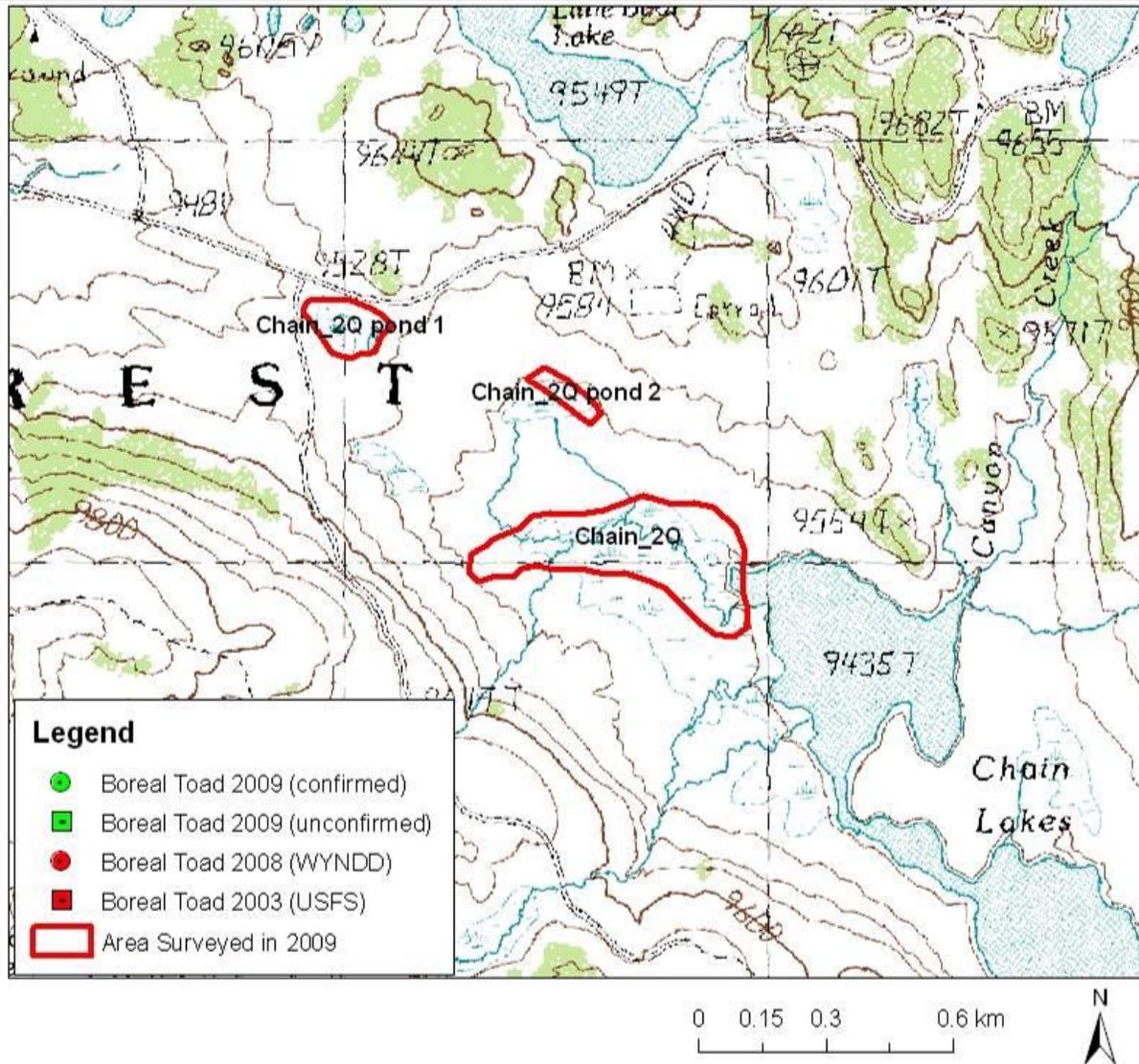
Date: 1 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 20 person-minutes of survey. *Weather:* Air temperature was 60°F with partly cloudy skies and moderate winds.

Habitat Notes: This site was a marsh dominated by sedges with some forbs.

Chain_2Q



Site: Chain_2Q

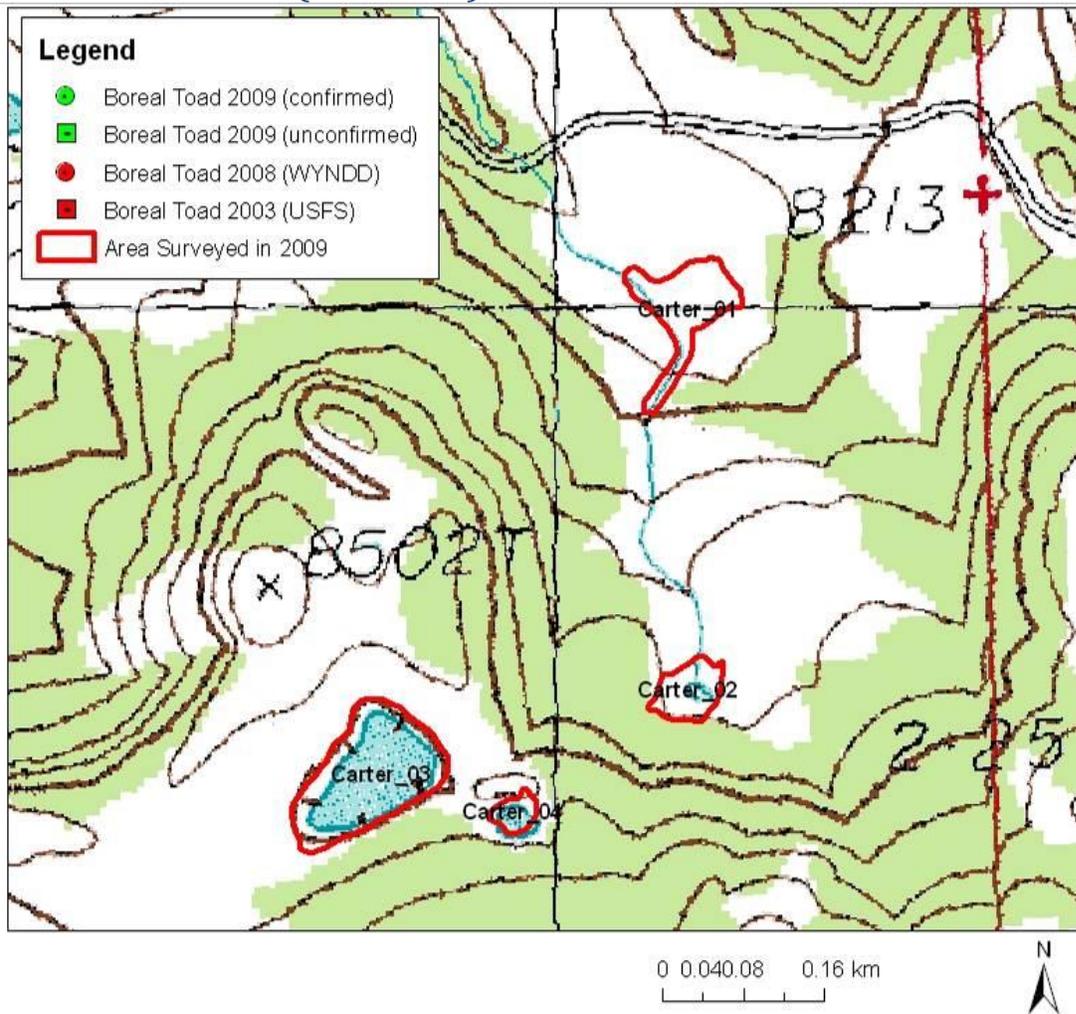
Date: 2 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 78 person-minutes of survey. *Weather:* Air temperature was 60° with overcast skies and light wind. Surveyed 2 small and one larger wetland/marsh in the Chain Lakes complex.

Habitat Notes: Site followed the stream channel and adjacent wetlands areas and contained willows, sedges, mosses, and forbs.

Carter Mountain (Sites 1-4)



Site: Carter_01, Carter_02, Carter_03, & Carter_04

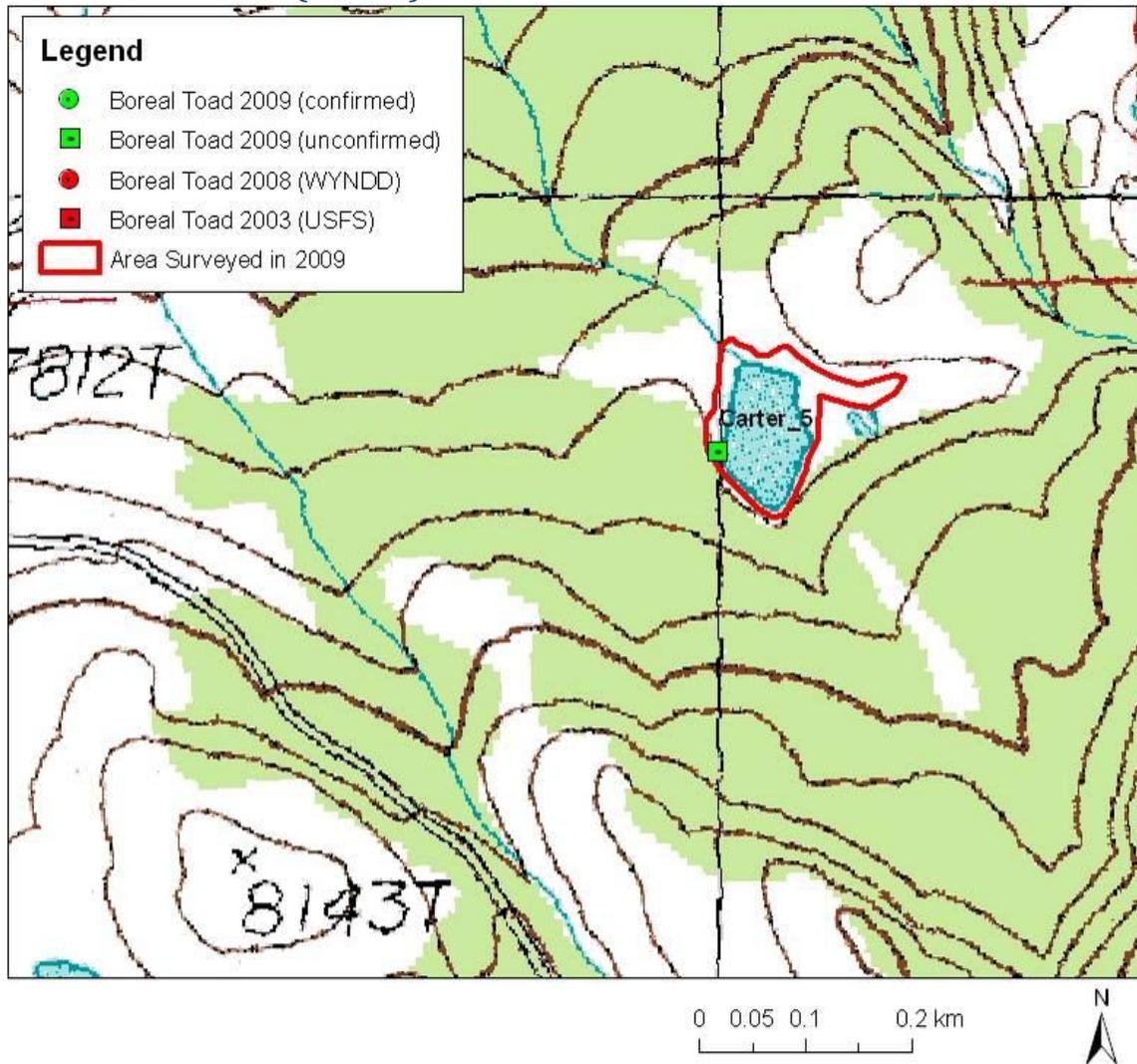
Date: 7-8 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 37 person-minutes of survey at Carter_01; 36 person-minutes at Carter_02; 72 person-minutes at Carter_03; 16 person-minutes at Carter_04. *Weather:* Air temperature was 62°F with partly cloudy skies and light wind.

Habitat Notes: Carter_01 was a partly dry marsh with lots of clay, tall willows, and sedges. Carter_02 was a marsh with sedges, rushes, willows, trees, and forbs. Pond had few shallows and was covered in thick yellow-brown duckweed. Carter_03 was a large open reservoir with a steep eastern shore, clear water, and emergent vegetation. This site looked good for amphibian breeding habitat and also contained lots of invertebrates and birds. Fish were present. Carter_04 was a marsh with a small pond. Pond contained clear water but had lots of duckweed. Marsh contained sedges, rushes, and grasses.

Carter Mountain (Site 5)



Site: Carter_05

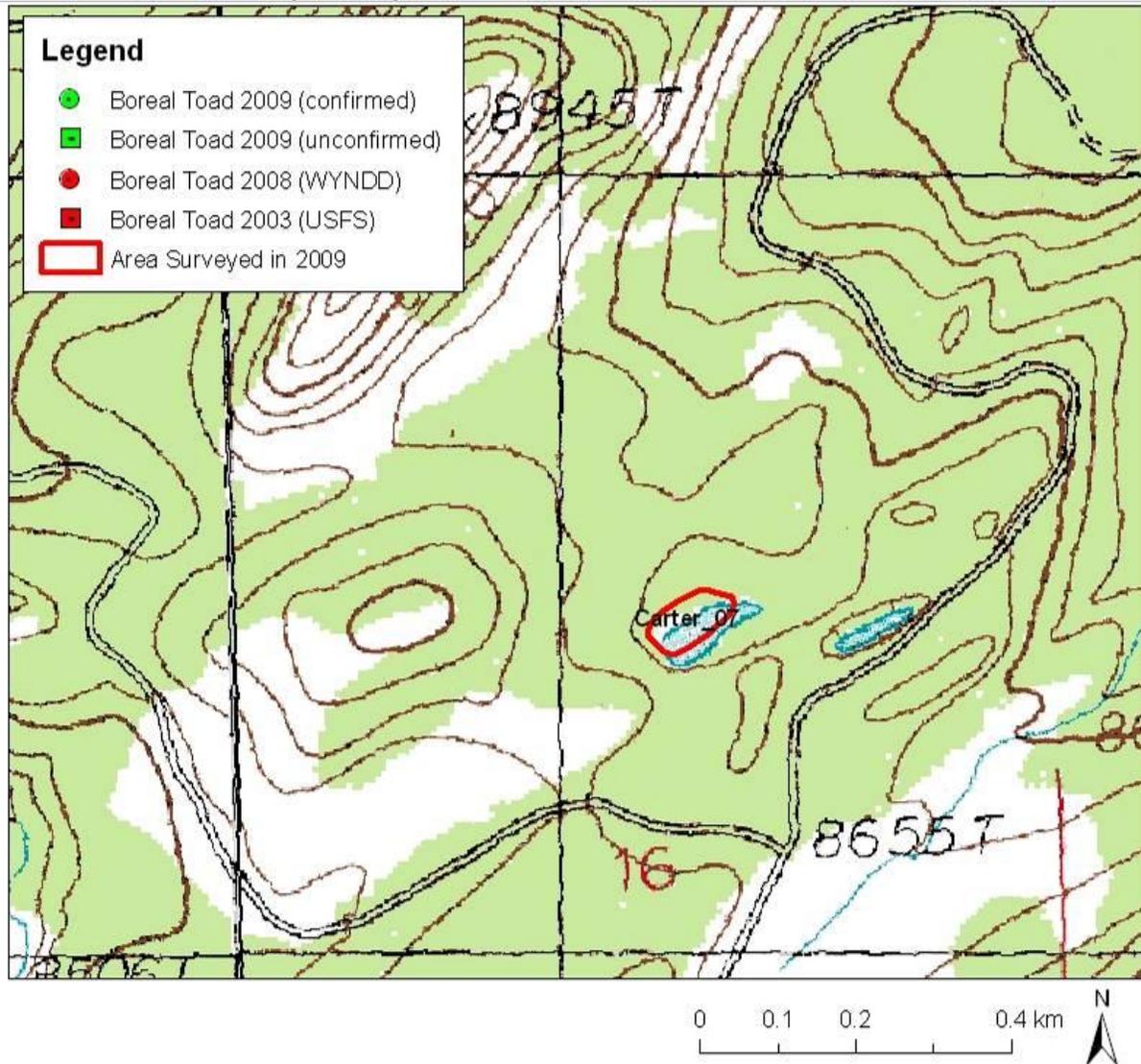
Date: 8 July 2009

Observations: One possible but unconfirmed adult Boreal Toad observed and one small unidentified amphibian seen. ***This site warrants further searches!***

Search Notes: *Effort:* 40 person-minutes of survey. *Weather:* Air temperature was 73°F with partly cloudy skies and winds increasing from light to strong in a short amount of time. Survey was cut short by strong winds since we had to walk through lots of dead snags to get to the site.

Habitat Notes: Pond with adjacent marsh containing sedges, trees, algae, and shrubs. Site was very promising as Boreal Toad habitat and should be re-surveyed in the future. Opaque teal/turquoise particles suspended on water surface. Best access to this site is via an old logging road on private land 1.1 miles before USFS border at a green gate.

Carter Mountain (Site 7)



Site: Carter_07

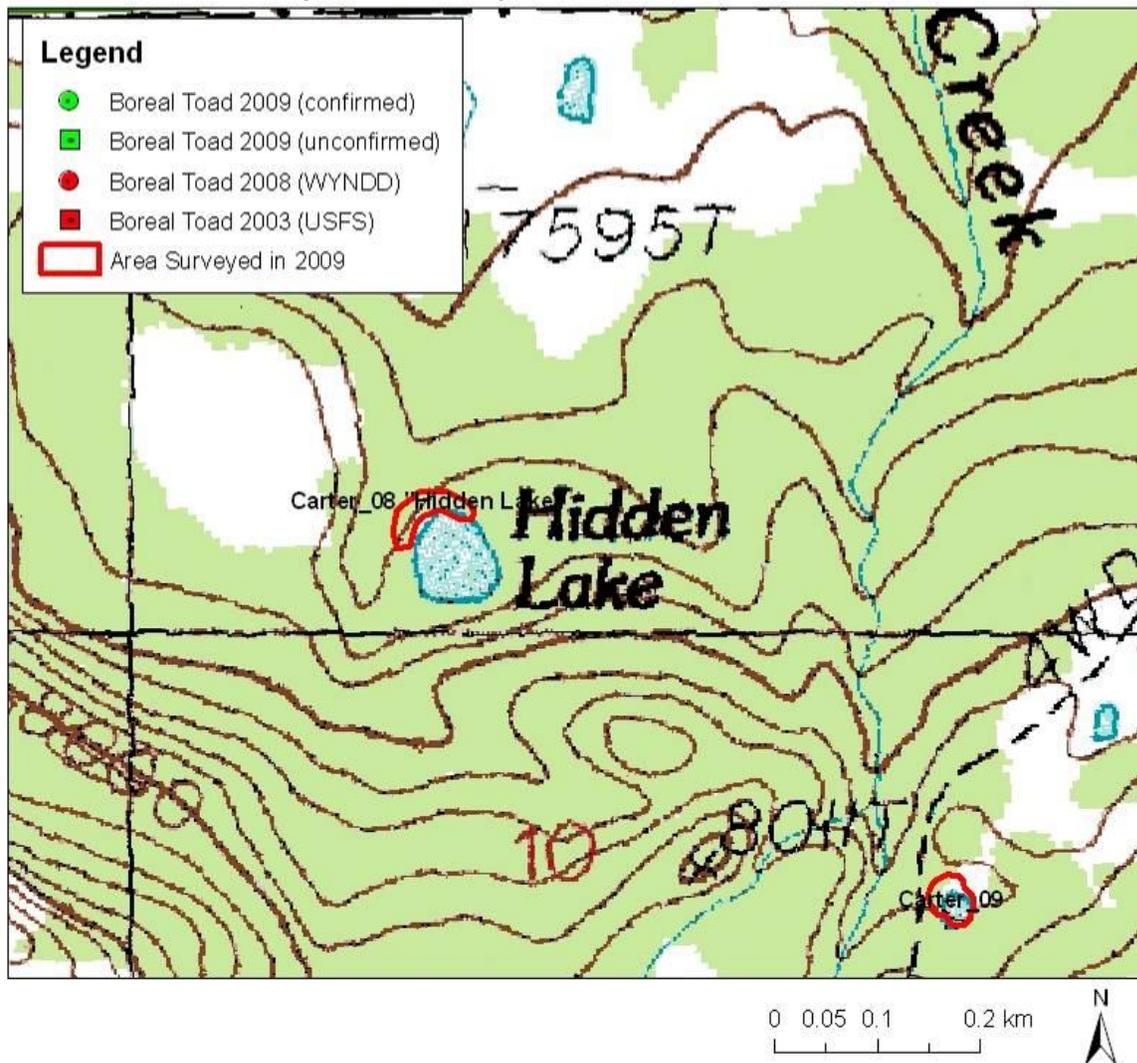
Date: 7 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 32 person-minutes of survey. *Weather:* Air temperature was 69°F with partly cloudy skies and light wind.

Habitat Notes: The site was a wetland with a steep, treed south bank, lots of open water, and few marshy areas. The area contained lots of sedges, trees, and forbs but had little emergent vegetation.

Carter Mountain (Sites 8 & 9)



Site: Carter_08 (Hidden Lake) & Carter_09

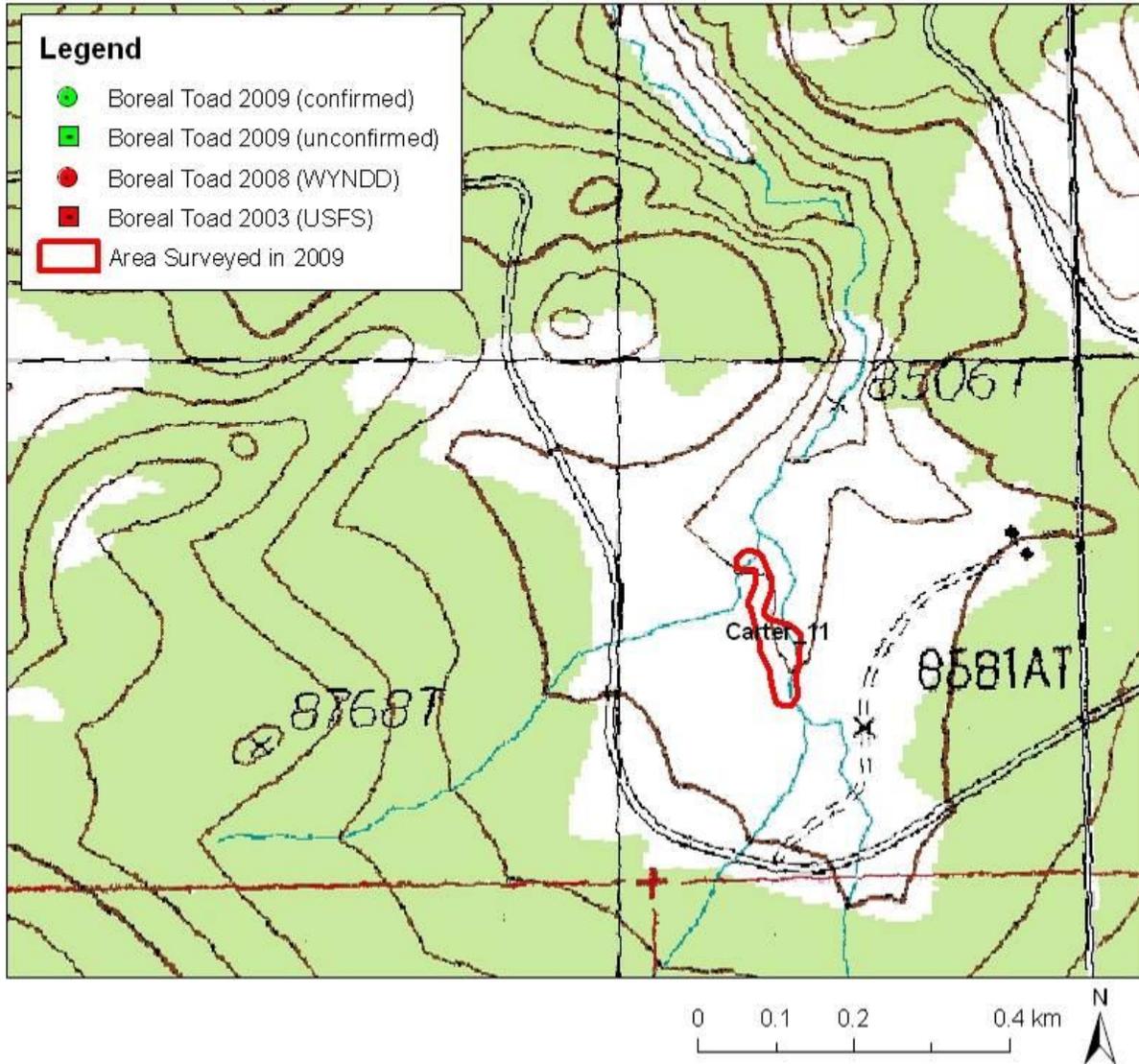
Date: 8 July 2009

Observations: One adult Spotted Frog and 1 unidentified frog observed at Carter_08. No amphibians observed at Carter_09.

Search Notes: *Effort:* 26 person-minutes of survey at Carter_08; 22 person-minutes at Carter_09. *Weather:* Air temperature was 70°F with partly cloudy skies and light wind.

Habitat Notes: Carter_08 (Hidden Lake) was a pond with adjacent wetlands with shrubs, sedges, rushes, trees, and forbs. Shallows, emergent vegetation, and lots of open clear water were present. The north shore was open and accessible but the south shore was steep and treed. Lake is supposed stocked with fish. Carter_09 was a marsh dominated by sedges with a few snags and small trickling stream. Many snails present.

Carter Mountain (Sites 8 & 9)



Site: Carter_11

Date: 7 July 2009

Observations: No amphibians observed.

Search Notes: *Effort:* 48 person-minutes of survey. *Weather:* Air temperature was 69°F with partly cloudy skies and light to moderate wind.

Habitat Notes: This site was a stream channel with adjacent wetlands dominated by willows and sedges. The site was very boggy.

APPENDIX: HABITAT PHOTOS



Pelham Lake



Clint Creek A



Clint Creek C



Middle Fork Long Creek C



Louis Lake Wetland A



Louis Creek



Lily Lake



Gilbert Fen



Deadman Creek



Deadman Swamp



Deadman Pond 2



Camp Creek Swamp



Clay Fen A_5



Clay Fen B_3QA



Clay Fen C_3Q



Swamp Lake A



Swamp Lake B



Corral Creek Swamp



Fen A_2



Fen B_1



Fantan_3



Fantan_3b



Fantan_4



Meadow_5



Fen C_4



Chain_2Q



Carter_01



Carter_02



Carter_03



Carter_04



Carter_05



Carter_07



Carter_08



Carter_09



Carter_11