

**Surveys for Odonates at high-elevation wetlands
Colville National Forest
Northeast Washington
Summer 2010
ISSSP Project**

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SUMMARY

This is the second year of a three-year project to document odonates that occupy high-elevation wetlands on the Colville National Forest in northeastern Washington. Of more than 40 high-elevation wetlands identified, we surveyed 8 ponds in 4 discrete areas in 2010 (building on a survey of ponds from the summer of 2009). We surveyed each site 3 times: early, mid- and late summer/early autumn during warm, sunny weather and during periods of the day that covered flight times of various odonates. We also kept track of incidental captures in NE Washington. We captured 26 different species overall and at each site photographed the first specimen of each species captured. We retained vouchers of the 4 county records documented and sent these to Dennis Paulson. We captured *Aeshna subarctica* at 1 site, making this the 6th capture in Washington (all but 1 site on the Colville NF). For *Aeshna* species, we measured the length of the first five males captured at a site to begin building a database of local body lengths.

INTRODUCTION

In northeastern Washington (NEWA), surveys for invertebrates, even the charismatic lepidids and odonates, have been ad hoc in nature until 2009. Though Cannings (2002) and Paulson (1999) list species that probably occur in NEWA, no systematic surveys have been conducted to document distribution, either by extent or elevation.

Since 2005, the Colville National Forest (CNF) has coordinated limited surveys for odonates at various sites on public land in NEWA. Most sites were located at low or mid elevations. The CNF has also maintained records of miscellaneous odonate sightings. These surveys and sightings have resulted in the documentation of 10 county records (first captures in a specific county) and records that have expanded the flight times of several species (D. Paulson, pers. comm.).

The Update of the Regional Forester's Sensitive Species Lists and Transmittal of Strategic Species List (USDA Forest Service 2008) listed 3 odonates as "strategic species":

1. *Aeshna subarctica*: 3 locations in WA, 2 on the CNF and 1 in Chelan Co.;
2. *Coenagrion interrogatum*: 2 location in WA, both on the CNF; and
3. *Leucorrhinia borealis*: 1 location in WA, near the Okanogan NF.

The next List will include *Somatochlora whitehousei* and *Somatochlora franklini*, which in Washington have only been recorded at one location, on the CNF (C. Hughes, pers. comm.). All of the above species are considered boreal obligates, their distribution being

either holarctic (*Aeshna subarctica*) or restricted to North America (the others). This boreal environment dips into Washington in two locations: the NE part of the state (the area covered by the CNF) and the central part of the state (the Okanogan Highlands).

METHODS

We used the National Wetlands Database GIS and the CNF digital elevation GIS coverages to identify about 40 high-elevation (above 3,500 feet) wetlands. We used the NAIP digital orthophoto and the existing roads coverages to identify 5 wetland areas or complexes greater than 5 acres in size (Table 1, Appendix for maps) that could relatively easily be accessed by road.

Table 1. Wetlands surveyed, locations, elevations, wetland sizes, and dates surveyed.

Location	WGS 84, UTM Zone 11N						
	Lat (N)	Long (W)	T	R	Sec	County	Elev (ft)
Sherman	48° 36.154	-118° 28.886	36	34	24	Ferry	5,920
Little Sherman	48° 35.971	-118° 28.178	36	34	19	Ferry	5,890
13 Mile 1	48° 30.186	-118° 37.867	35	33	26	Ferry	4,165
13 Mile 2	48° 30.033	-118° 37.183	35	33	25	Ferry	4,133
13 Mile 3	48° 30.150	-118° 36.967	35	33	25	Ferry	4,186
Rufus Meadows	48° 35.357	-117° 28.775	36	42	26/27	Pend Oreille	4,073
Daily Miller	48° 39.371	-118° 12.078	37	36	35	Ferry	3,802
Nancy Creek	48° 37.810	-118° 10.705	36	37	8	Ferry	4,351

Locality	Dates surveyed 2010		
13 Mile Pond 1	15-Jul	16-Aug	22-Sep
13 Mile Pond 2			22-Sep
13 Mile Pond 3	15-Jul	16-Aug	22-Sep
Daily Miller Pond	13-Jul	13-Aug	28-Sep
Little Sherman Pond	8-Jul	18-Aug	29-Sep
Nancy Creek Pond	13-Aug	28-Sep	
Rufus Meadows	7-Jul	12-Aug	27-Sep
Sherman Pond	8-Jul	18-Aug	29-Sep
Slate Creek Pond*	9-Jul		

*Discovered that this site would not be possible to survey

Odonates flight periods vary by species and we scheduled surveys to occur 3 times during the summer: early summer period between mid-June and mid-July, mid-summer period between mid-July and mid-August, and late summer/early autumn period after mid-August but before frosts.

Between 2 and 4 people surveyed each wetland area on warm, sunny days to maximize flying odonates. Surveyors walked the entire wetland and associated dry, open uplands, if present. Each time an odonate was caught it was identified or placed in a live container

Table 2. Results of odonate surveys, by survey period and wetland, on the Colville National Forest, Summer 2010.

Survey periods: 1 = early summer, 2 = mid-summer, 3 = late summer.

Scientific name	Common name	13 Mile 1	13 Mile 2*	13 Mile 3	Daily Miller	Little Sherman	Sherman	Nancy Creek	Rufus Meadows	Incidental
Aeshna canadensis	Canada Darner			2-3				2		
Aeshna constricta	Lance-tipped Darner				2 (Co. record)					
Aeshna eremita	Lake Darner						2-3		2	
Aeshna interrupta	Variable Darner		3	2-3				2		
Aeshna juncea	Sedge Darner								2-3	
Aeshna palmata	Paddle-tailed Darner		3	2	2-3		2-3		2-3	
Aeshna sitchensis	Zigzag Darner								2-3	
Aeshna subarctica	Subarctic Darner								3	
Aeshna tuberculifera	Black-tipped Darner		3					2 (Co. record)		
Aeshna umbrosa	Shadow Darner								2-3	
Coenagrion resolutum	Taiga Bluet			1			2		1	
Cordulia shurtleffii	American Emerald								1-2	
Enallagma carunculatum	Tule Bluet								3	
Epitheca spinigera	Spiny Baskettail								2	
Lestes congener	Spotted Spreadwing			3	3			3	3	
Lestes disjunctus	Common Spreadwing	2		2	2		2	2	2	
Lestes dryas	Emerald Spreadwing	1-2		1-2	2	2		2		
Lestes unguiculatus	Lyre-tipped Spreadwing	2						3		
Leucorrhinia hudsonica	Hudsonian Whiteface								1	
Libellula quadrimaculata	Four-spotted Skimmer	1-2		1					1-2	
Somatochlora semicircularis	Mountain Emerald	1-2		1-2	2		1-2		1	1
Sympetrum corruptum	Variegated Meadowhawk					2	2		2	2 (Co. record)
Sympetrum costiferum	Saffron-winged Meadowhawk				2					
Sympetrum danae	Black Meadowhawk White-faced		3	2-3					3	
Sympetrum obtrusum	Meadowhawk	1-2	3	1-2-3	2		2	2-3	2-3	
Sympetrum pallipes	Striped Meadowhawk			2	2-3			2-3		
Cordulegaster dorsalis	Pacific Spiketail									1 (Co. record)

*only surveyed during last/latest session

for identification later that day. If the lead surveyor was uncertain of the identification, he would voucher the specimen. The first time a species was captured at a site, we photographed it to establish a photo database. Specimens identified as county records were vouchered. The overall length of the first 5 of each *Aeshna* species at a site was measured to develop a database of lengths. All vouchered specimens were sent to D. Paulson for identification and permanent housing.

RESULTS & DISCUSSION

We captured and identified 26 different species of odonates (Table 2). Early season proved the least productive at the high elevation areas (Table 3), though anecdotal observations from lower elevation wetlands indicate that many more species fly earlier at lower elevations than at higher ones. Early cold weather at high elevations probably resulted in lower late-summer numbers than in 2009.

Table 3. Number of species captured, by location and capture session.

Total # species	13 Mile Complex	Nancy Ck Complex	Sherman Complex	Rufus Meadows
Early summer	5	0	1	5
Mid summer	11	11	8	11
Late summer	7	5	2	9

We captured *Aeshna subarctica* at 1 new location (6 know in WA previously, 5 on Colville NF). We captured 4 new county records, *Aeshna constricta*, *Aeshna tuberculifera*, *Sympetrum corruptum*, and *Cordulegaster dorsalis*. All county records were vouchered and the specimens sent to D. Paulson.

We measured overall length of *Aeshna* males at each site, up to the first 5/site, each survey period and will combine these with data from last year and eventually compare these with average lengths of *Aeshna* species in BC (Cannings 2002) and values for WA (Paulson 1999) (Table 4). All measurements were supplied to D. Paulson.

Table 4. Mean values of *Aeshna* males captured in WA and in BC.

	WA (mm)		BC (mm)	
	Low	High	Low	High
<i>A. canadensis</i>	62	68	65	71
<i>A. eremita</i>	69	77	71	79
<i>A. interrupta</i>	60	66	67	74
<i>A. juncea</i>	60	66	63	69
<i>A. palmata</i>	65	71	68	76
<i>A. sitchensis</i>	56	62	56	62
<i>A. subarctica</i>	NA*	NA	65	71
<i>A. tuberculifera</i>	65	71	69	77
<i>A. umbrosa</i>	62	68	67	74

Adults of different species emerge for different flight periods, though we caution against using the flight periods to predict species occurrence yet because of the low number of specimens captured or low number of sites at which they were captured (Table 4).

Records for all species have been supplied to D. Paulson and have been placed in a spreadsheet and will be entered into the NRIS Wildlife database this winter. County records verified by D. Paulson have been uploaded to OdonataCentral (<http://www.odonatacentral.org/>).

Over the next several decades, climate change will affect conditions at wetlands across the globe, and those at higher elevations and latitudes will probably experience the greatest changes. This project is one of many that documents a snapshot in time and provides a baseline against which future work can be compared.

The work to survey high-elevation wetlands across the Colville National Forest started using ISSSP funds in 2009 and will continue through 2011.

LITERATURE CITED

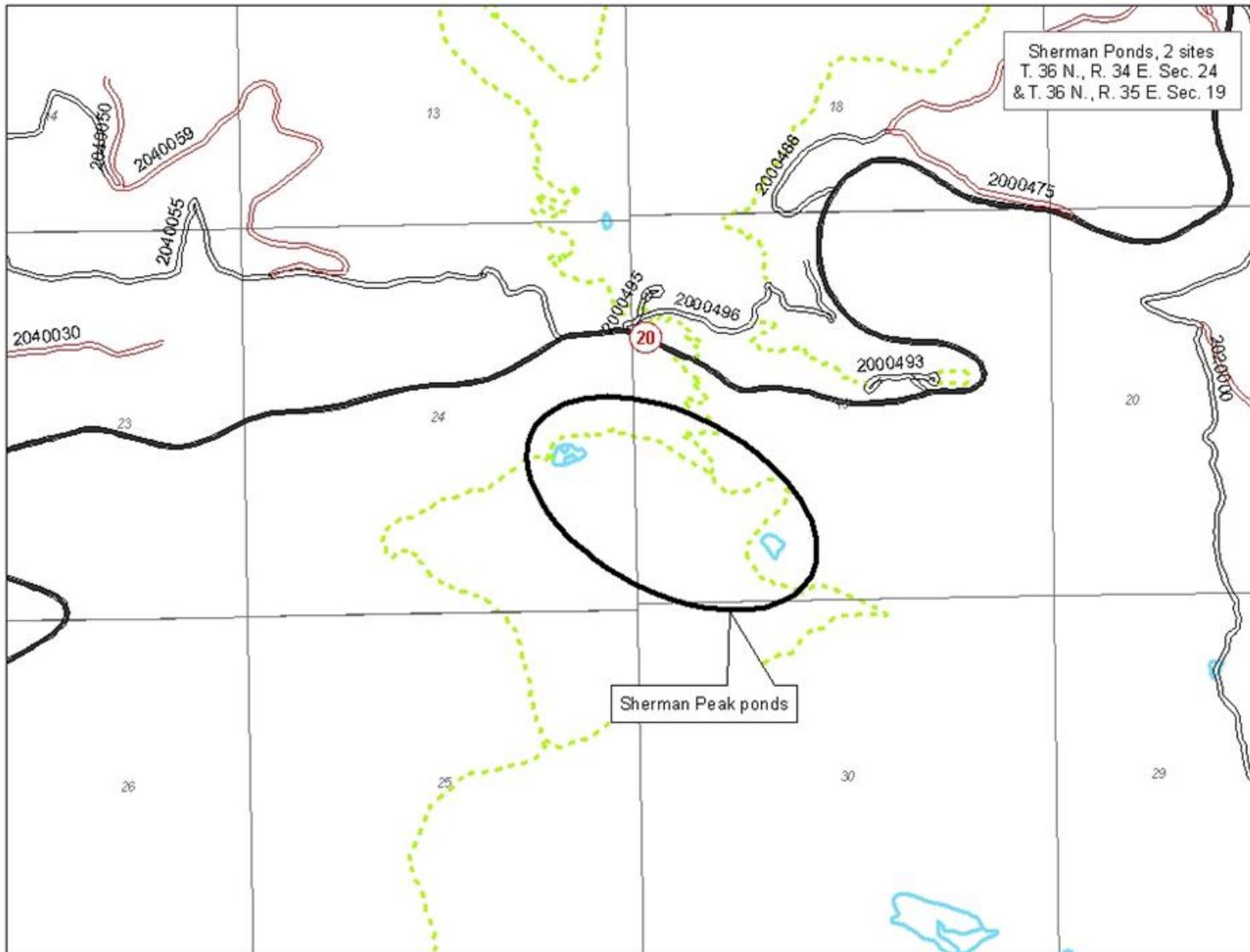
Cannings, Robert A. 2002. *Introducing the Dragonflies of British Columbia and the Yukon*. Royal British Columbia Museum, Victoria, BC. 96 pp.

Paulson, Dennis. 1999. *Dragonflies of Washington*. Seattle Audubon Society, Seattle, WA. 32 pp.

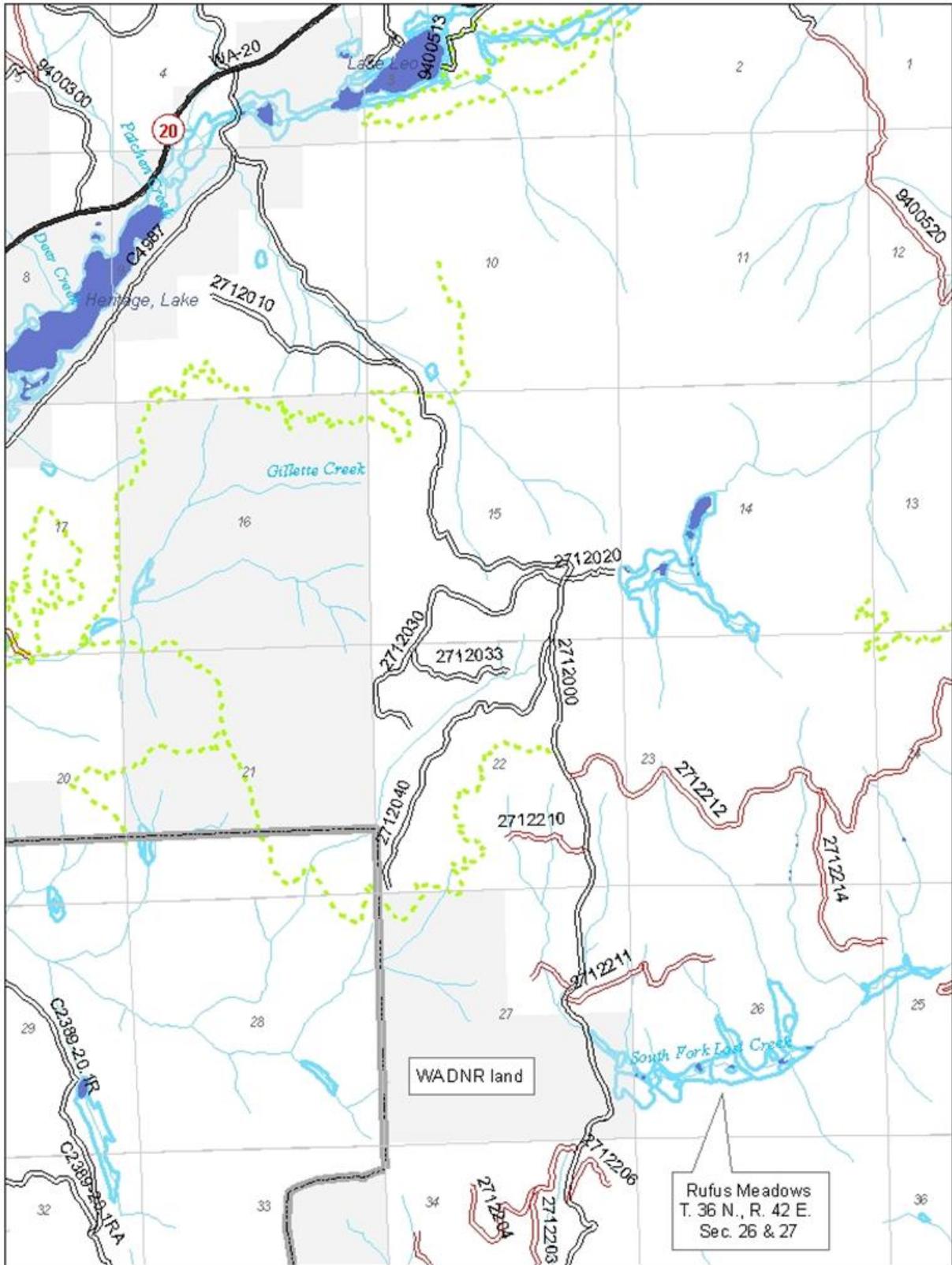
USDA Forest Service. 2008. *Update of the Regional Forester's Sensitive Species Lists and Transmittal of Strategic Species List*. Letter from Regional Forester Linda Goodman to Forest Supervisors, January 31, 2008. 2 pages plus 2 enclosures.

Appendix 1. Site maps and photos.

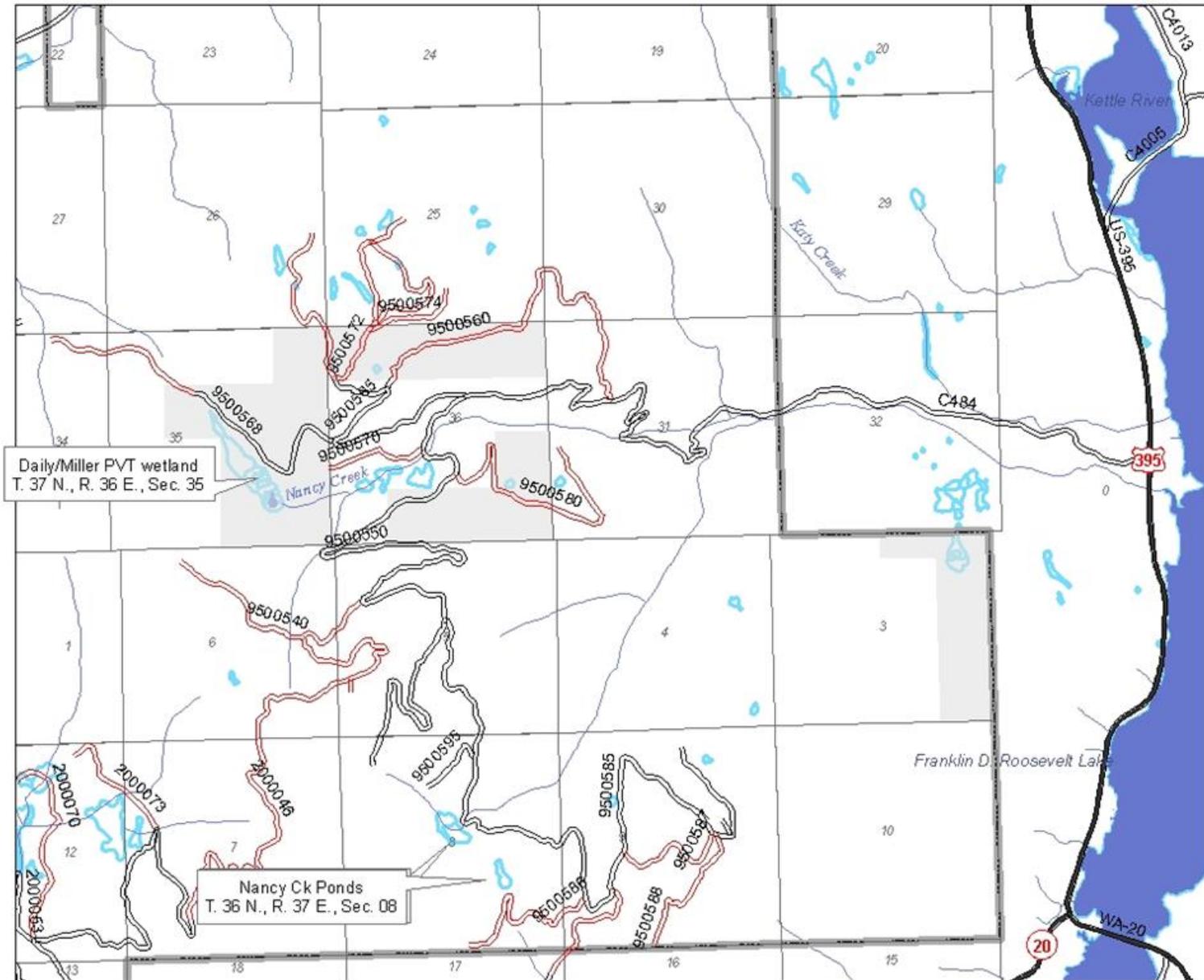
Sherman Ponds: 2 small sites of about 3 acres each.



Rufus Meadows: South of Granite Meadows (surveyed in 2009). Ponds and stringers of open water probably originally created (and still maintained) by beavers.



Nancy Creek and Daily/Miller ponds: 2 ponds in the same watershed but about 2 miles apart. Daily/Miller on private land (landowner permission granted).



Thirteen-mile Creek Ponds: Series of 3 ponds, 1 very difficult to access, in 2 drainages.

