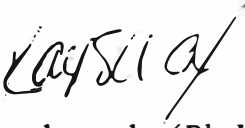


CANAAN VALLEY NWR
U. S. FISH AND WILDLIFE SERVICE
MEMORANDUM

DATE: 14 November 2008

TO: File

FROM: Kaysie Cox 

SUBJECT: Cheat Mountain salamander (*Plethodon nettingi*) coverboard data analysis

Data was collected from three Cheat Mountain salamander coverboard sites: Cabin Knob A, Cabin Knob B, and Bald knob from 2000 to Present.

This data was entered into a database, and analyzed in Excel. Various comparisons of the data were made. The following is a breakdown of the data. Attached is a copy of the raw data, the analyzed data, and the graphs made from the data.

The following table contains a breakdown of each site, showing which species were found there, and in what quantity.

SPECIES BREAKDOWN		
Location	Species	Number found
Bald Knob	Unknown	1
Bald Knob	Desmognathus fuscus	2
Bald Knob	Desmognathus spp.	3
Bald Knob	Desmognathus ocrophaeus	66
Bald Knob	Plethodon cinereus	165
Cabin Knob A	Plethodon spp.	1
Cabin Knob A	Plethodon cinereus	192
Cabin Knob B	Eurycea bislineata	1
Cabin Knob B	Plethodon nettingi	13
Cabin Knob B	Plethodon cinereus	297

The following table shows the average physical characteristics of each site.

PHYSICAL PROPERTIES			
Location	Average Temp(°C)	Average pH	Average % Moisture
Bald Knob	18.27	5.87	57.53
Cabin Knob A	19.06	5.88	61.18
Cabin Knob B	19.55	5.77	64.66

The following table shows data from each recorded *P. nettingi* individual found.

CHEAT MOUNTAIN SALAMANDER DATA

Location	Date	Temperature (C)	Soil Moisture	pH	Number Found
Cabin Knob B	5/22/2000				1
Cabin Knob B	7/12/2000				1
Cabin Knob B	5/23/2001	22	55	5	1
Cabin Knob B	6/11/2001	20	68	5	1
Cabin Knob B	6/26/2001	22	80	6	1
Cabin Knob B	8/14/2001	20	95	4	1
Cabin Knob B	7/26/2002	17	68	5	1
Cabin Knob B	6/18/2003	17	85	6	1
Cabin Knob B	6/27/2003		65	7	1
Cabin Knob B	7/11/2003	13	95	6	1
Cabin Knob B	7/9/2004	15	75	6	1
Cabin Knob B	6/14/2005	25	98	6	1
Cabin Knob B	7/26/2007	23			1

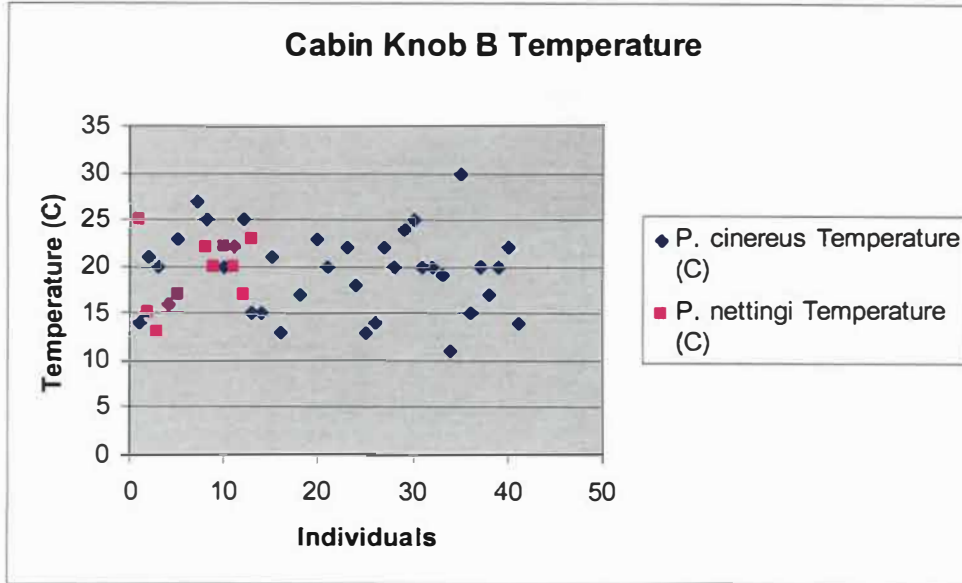
This table shows the average characteristics for the sites where *P. nettingi* was found.

Average Temperature	Average Soil Moisture	Average pH
19.4	78.4	5.6

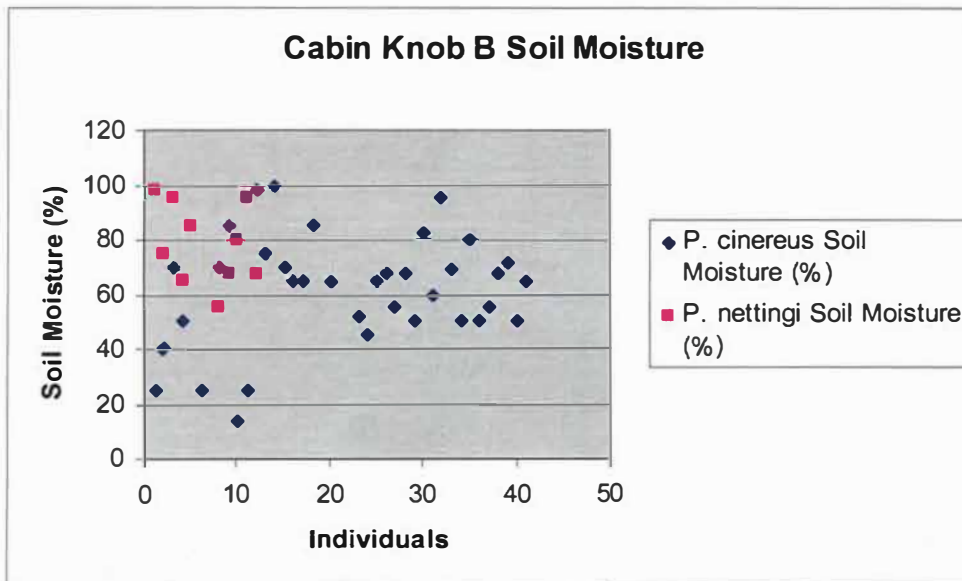
The next table shows when each *P. nettingi* was found, and then displays which months *P. nettingi* were found in throughout the years, and how many *P. nettingi* were found each year.

<i>P. nettingi</i> found	Months Found	Years Found
May 2000: 1	May - 2	2000 - 2
July 2000: 1	June - 5	2001 - 4
May 2001: 1	July - 6	2002 - 2
June 2001: 2	August - 1	2003 - 3
Aug 2001: 1		2004 - 1
July 2002: 2		2005 - 1
June 2003: 2		2006 - 0
July 2003: 1		2007 - 1
July 2004: 1		
June 2005: 1		
July 2007: 1		

Graphs were made to compare the air temperature at which *P. nettingi* and *P. cinereus* individuals were found on Cabin Knob B. The graph does not appear to show any discernable difference between the temperature at which *P. nettingi* and *P. cinereus* individuals were found. However, this data may change as more *P. nettingi* records are entered into the database.



Another graph was created to compare the soil moisture at which *P. nettingi* and *P. cinereus* individuals were found on Cabin Knob B. This graph does appear to show that *P. nettingi* individuals are found in areas of higher soil moisture than *P. cinereus*. Again, this data may change as more *P. nettingi* records are entered into the database.

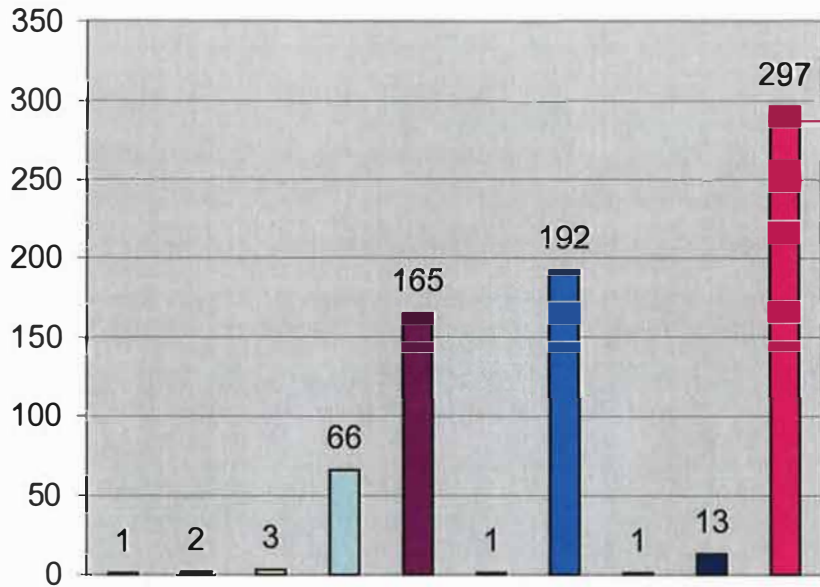


Two other charts, comparing the physical characteristics of the three coverboard sites, seem to show no significant difference between the temperatures of the three sites. However, when comparing the soil moisture of the three sites, it does appear that Cabin

Knob B (the site where all the *P. nettingi* were found) has higher soil moisture than the other two sites. These two charts are found in the attached data.

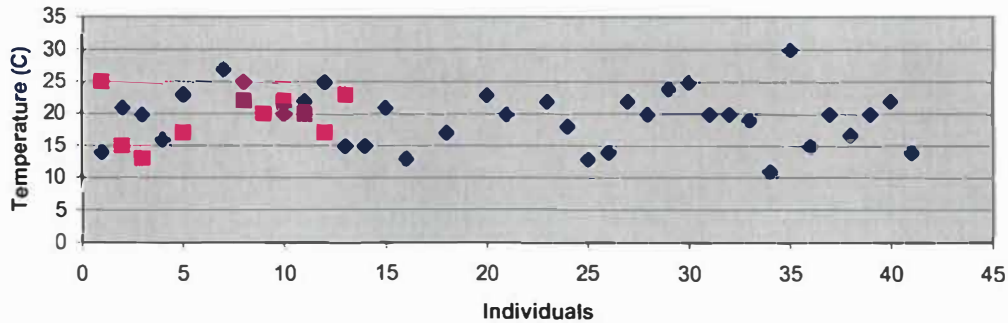
SPECIES BREAKDOWN						
Location	Species	Number found				
Bald Knob	Unknown	1				
Bald Knob	Desmognathus fuscus	2				
Bald Knob	Desmognathus spp.	3				
Bald Knob	Desmognathus ocropheus	66				
Bald Knob	Plethodon cinereus	165				
Cabin Knob A	Plethodon spp.	1				
Cabin Knob A	Plethodon cinereus	192				
Cabin Knob B	Eurycea bislineata	1				
Cabin Knob B	Plethodon nettingi	13				
Cabin Knob B	Plethodon cinereus	297				
PHYSICAL PROPERTIES						
Location	Average Temp(°C)	Average pH	Average % Moisture			
Bald Knob	18.27	5.87	57.53			
Cabin Knob A	19.06	5.88	61.18			
Cabin Knob B	19.55	5.77	64.66			
CHEAT MOUNTAIN SALAMANDER DATA						
Location	Date	Temperature (C)	Soil Moisture	pH	Species	Number
Cabin Knob B	5/22/2000				Plethodon nettingi	1
Cabin Knob B	7/12/2000				Plethodon nettingi	1
Cabin Knob B	5/23/2001	22	55	5	Plethodon nettingi	1
Cabin Knob B	6/11/2001	20	68	5	Plethodon nettingi	1
Cabin Knob B	6/26/2001	22	80	6	Plethodon nettingi	1
Cabin Knob B	8/14/2001	20	95	4	Plethodon nettingi	1
Cabin Knob B	7/26/2002	17	68	5	Plethodon nettingi	1
Cabin Knob B	6/18/2003	17	85	6	Plethodon nettingi	1
Cabin Knob B	6/27/2003		65	7	Plethodon nettingi	1
Cabin Knob B	7/11/2003	13	95	6	Plethodon nettingi	1
Cabin Knob B	7/9/2004	15	75	6	Plethodon nettingi	1
Cabin Knob B	6/14/2005	25	98	6	Plethodon nettingi	1
Cabin Knob B	7/26/2007	23			Plethodon nettingi	1
		Average	Average	Average		
		19.4	78.4	5.6		

SPECIES BREAKDOWN



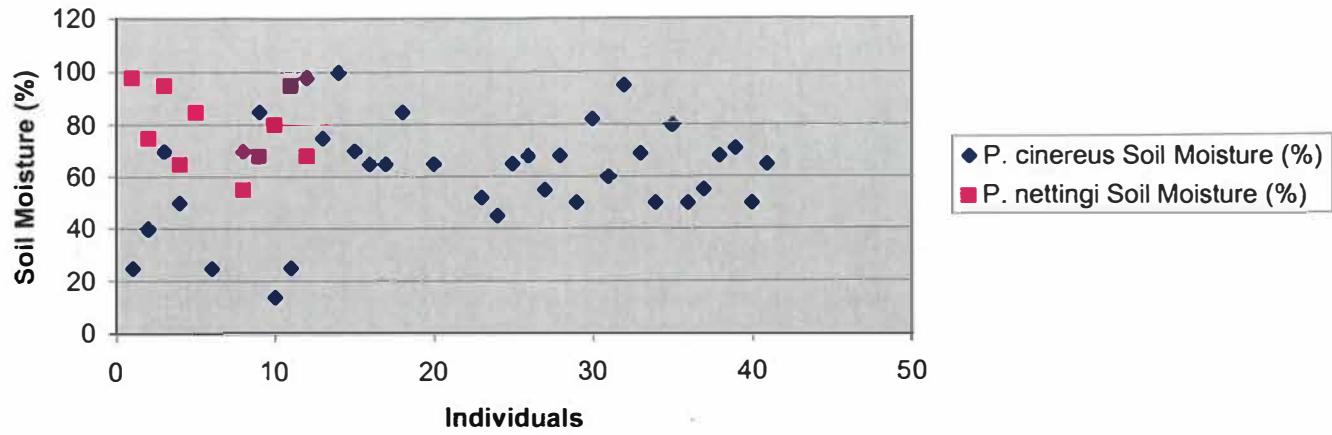
- Bald Knob Unknown
- Bald Knob Desmognathus fuscus
- Bald Knob Desmognathus spp.
- Bald Knob Desmognathus ocrophaeus
- Bald Knob Plethodon cinereus
- Cabin Knob A Plethodon spp.
- Cabin Knob A Plethodon cinereus
- Cabin Knob B Eurycea bislineata
- Cabin Knob B Plethodon nettingi
- Cabin Knob B Plethodon cinereus

Cabin Knob B Temperature

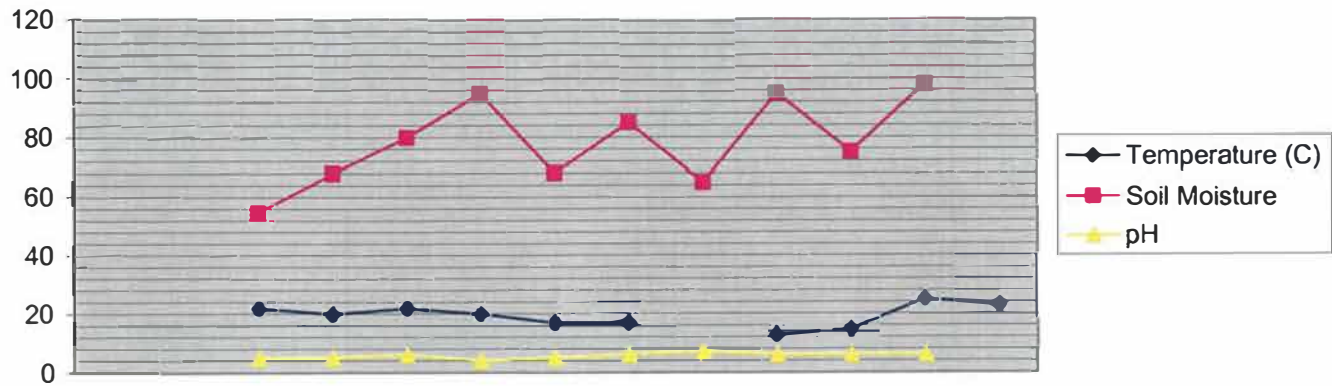


- ◆ P. cinereus Temperature (C)
- P. nettingi Temperature (C)

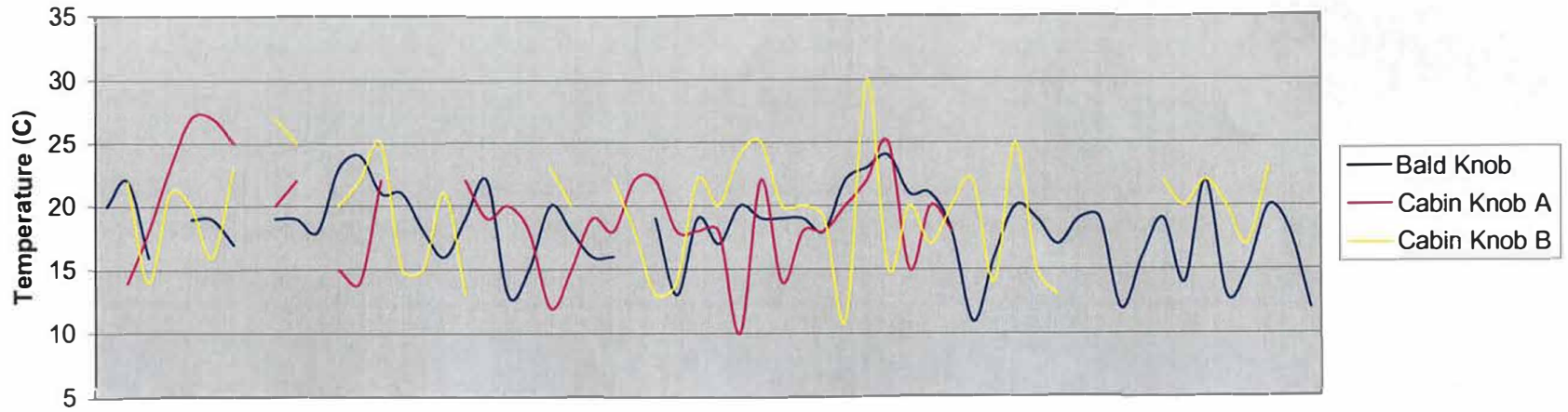
Cabin Knob B Soil Moisture



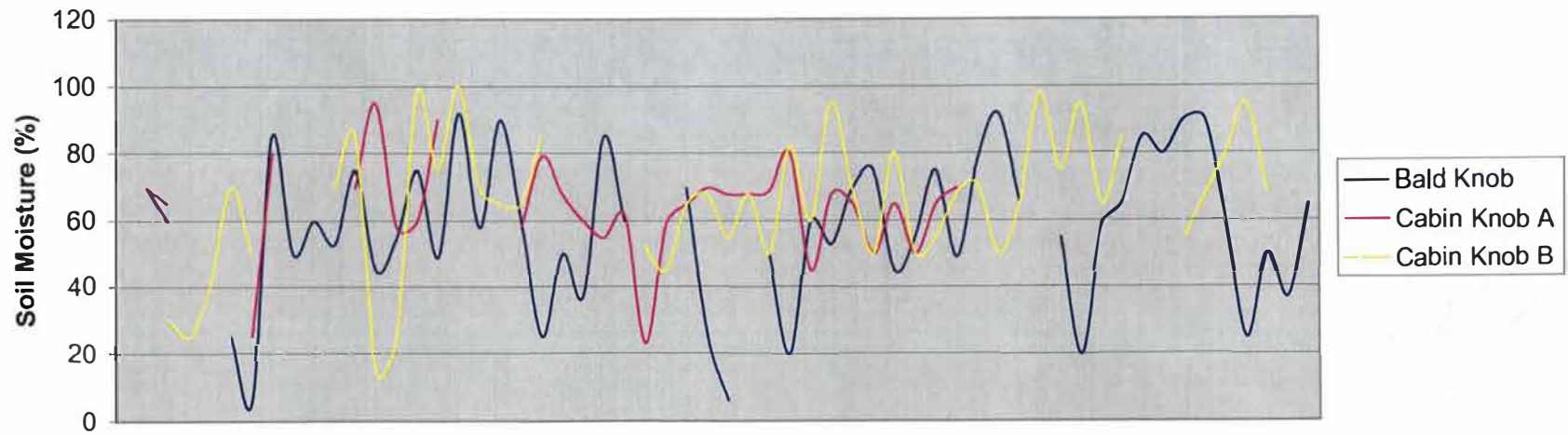
Plethodon nettingi at Cabin Knob B



Temperature (C)



Soil Moisture



ID	Location	Date	Temperature (C)	Soil Moisture	pH	Species	Number	UTM E	UTM N
24	Bald Knob	8/30/2007	20			<i>Desmognathus fuscus</i>	1	0	0
119	Bald Knob	6/11/2001	22	70	6	<i>Desmognathus fuscus</i>	1	0	0
2	Bald Knob	9/11/2008	16	60	5	<i>Desmognathus ocrophaeus</i>	1	0	0
8	Bald Knob	7/17/2008				<i>Desmognathus ocrophaeus</i>	3	0	0
10	Bald Knob	7/26/2008	19			<i>Desmognathus ocrophaeus</i>	8	0	0
19	Bald Knob	6/18/2007	19	25	6	<i>Desmognathus ocrophaeus</i>	2	0	0
22	Bald Knob	6/16/2007	17	6	7	<i>Desmognathus ocrophaeus</i>	8	0	0
31	Bald Knob	7/14/2006		85	4	<i>Desmognathus ocrophaeus</i>	3	0	0
35	Bald Knob	8/18/2006	19	50	6	<i>Desmognathus ocrophaeus</i>	3	0	0
115	Bald Knob	5/24/2001	19	60	5	<i>Desmognathus ocrophaeus</i>	1	0	0
117	Bald Knob	5/31/2002	18	53	6	<i>Desmognathus ocrophaeus</i>	1	0	0
120	Bald Knob	6/26/2001	23	75	6	<i>Desmognathus ocrophaeus</i>	2	0	0
122	Bald Knob	7/10/2001	24	45	6	<i>Desmognathus ocrophaeus</i>	5	0	0
124	Bald Knob	7/31/2001	21	55	5	<i>Desmognathus ocrophaeus</i>	2	0	0
127	Bald Knob	8/14/2001	21	75	5	<i>Desmognathus ocrophaeus</i>	4	0	0
128	Bald Knob	8/28/2001	18	49	6	<i>Desmognathus ocrophaeus</i>	4	0	0
132	Bald Knob	6/13/2002	16	92	6	<i>Desmognathus ocrophaeus</i>	2	0	0
139	Bald Knob	9/18/2002	19	58	5	<i>Desmognathus ocrophaeus</i>	1	0	0
147	Bald Knob	9/8/2003	22	90	6	<i>Desmognathus ocrophaeus</i>	1	0	0
149	Bald Knob	6/1/2004	13	60	6	<i>Desmognathus ocrophaeus</i>	6	0	0
151	Bald Knob	7/9/2004	15	25	6	<i>Desmognathus ocrophaeus</i>	4	0	0
152	Bald Knob	6/14/2005	20	50	7	<i>Desmognathus ocrophaeus</i>	4	0	0
155	Bald Knob	9/16/2005	18	37	6	<i>Desmognathus ocrophaeus</i>	1	0	0
143	Bald Knob	6/18/2003	16	85	6	<i>Desmognathus spp.</i>	3	0	0
1	Bald Knob	9/11/2008	16	60	5	<i>Plethodon cinereus</i>	3	0	0
7	Bald Knob	7/17/2008				<i>Plethodon cinereus</i>	5	0	0
9	Bald Knob	7/26/2008	19			<i>Plethodon cinereus</i>	5	0	0
13	Bald Knob	6/24/2008	13	70	6	<i>Plethodon cinereus</i>	4	0	0
18	Bald Knob	6/18/2007	19	25	6	<i>Plethodon cinereus</i>	10	0	0
21	Bald Knob	6/16/2007	17	6	7	<i>Plethodon cinereus</i>	12	0	0
23	Bald Knob	8/30/2007	20			<i>Plethodon cinereus</i>	3	0	0
34	Bald Knob	8/18/2006	19	50	6	<i>Plethodon cinereus</i>	7	0	0
108	Bald Knob	8/23/2002	19	20	7	<i>Plethodon cinereus</i>	1	0	0
114	Bald Knob	5/24/2001	19	60	5	<i>Plethodon cinereus</i>	1	0	0
116	Bald Knob	5/31/2002	18	53	6	<i>Plethodon cinereus</i>	5	0	0
118	Bald Knob	6/11/2001	22	70	6	<i>Plethodon cinereus</i>	3	0	0

121	Bald Knob	6/26/2001	23	75	6	Plethodon cinereus	2	0	0
123	Bald Knob	7/10/2001	24	45	6	Plethodon cinereus	5	0	0
125	Bald Knob	7/31/2001	21	55	5	Plethodon cinereus	8	0	0
126	Bald Knob	8/14/2001	21	75	5	Plethodon cinereus	7	0	0
129	Bald Knob	8/28/2001	18	49	6	Plethodon cinereus	7	0	0
130	Bald Knob	9/14/2001	11	78	5	Plethodon cinereus	2	0	0
131	Bald Knob	6/13/2002	16	92	6	Plethodon cinereus	4	0	0
133	Bald Knob	6/27/2002	20	66	6	Plethodon cinereus	6	0	0
134	Bald Knob	7/26/2002	19		5	Plethodon cinereus	3	0	0
135	Bald Knob	8/8/2002	17	55	6	Plethodon cinereus	3	0	0
137	Bald Knob	8/23/2002	19	20	7	Plethodon cinereus	1	0	0
138	Bald Knob	9/18/2002	19	58	5	Plethodon cinereus	9	0	0
140	Bald Knob	5/27/2003	12	65	6	Plethodon cinereus	3	0	0
142	Bald Knob	6/18/2003	16	85	6	Plethodon cinereus	7	0	0
144	Bald Knob	6/27/2003	19	80	7	Plethodon cinereus	7	0	0
145	Bald Knob	7/11/2003	14	90	6	Plethodon cinereus	8	0	0
146	Bald Knob	9/8/2003	22	90	6	Plethodon cinereus	7	0	0
148	Bald Knob	6/1/2004	13	60	6	Plethodon cinereus	5	0	0
150	Bald Knob	7/9/2004	15	25	6	Plethodon cinereus	6	0	0
153	Bald Knob	6/14/2005	20	50	7	Plethodon cinereus	2	0	0
154	Bald Knob	9/16/2005	18	37	6	Plethodon cinereus	4	0	0
141	Bald Knob	5/27/2003	12	65	6	Unknown	1	0	0
56	Cabin Knob A	5/11/2000				NONE	0	0	0
3	Cabin Knob A	8/8/2008	14	70	6	Plethodon cinereus	5	0	0
11	Cabin Knob A	6/24/2008	18	65	5	Plethodon cinereus	4	0	0
14	Cabin Knob A	7/26/2008	23			Plethodon cinereus	10	0	0
17	Cabin Knob A	6/18/2007	27	25	6	Plethodon cinereus	8	0	0
25	Cabin Knob A	8/30/2007	27			Plethodon cinereus	4	0	0
28	Cabin Knob A	6/16/2006	25	25	6	Plethodon cinereus	14	0	0
30	Cabin Knob A	7/14/2006		80	4	Plethodon cinereus	3	0	0
32	Cabin Knob A	8/18/2006	20			Plethodon cinereus	5	0	0
37	Cabin Knob A	9/16/2005	22	25	6	Plethodon cinereus	5	0	0
40	Cabin Knob A	6/14/2005				Plethodon cinereus	2	0	0
41	Cabin Knob A	7/9/2004	15	70	6	Plethodon cinereus	6	0	0
45	Cabin Knob A	6/1/2004	14	95	6	Plethodon cinereus	3	0	0
47	Cabin Knob A	9/8/2003	22	58	6	Plethodon cinereus	9	0	0
50	Cabin Knob A	6/27/2003		60	7	Plethodon cinereus	8	0	0

53	Cabin Knob A	6/18/2003	16	90	6	Plethodon cinereus	4	0	0
58	Cabin Knob A	5/22/2000				Plethodon cinereus	4	0	0
61	Cabin Knob A	6/12/2000	22	55	6	Plethodon cinereus	1	0	0
63	Cabin Knob A	6/21/2000	19			Plethodon cinereus	3	0	0
68	Cabin Knob A	8/9/2000	20	58	7	Plethodon cinereus	1	0	0
70	Cabin Knob A	8/22/2000	18	79	5	Plethodon cinereus	5	0	0
72	Cabin Knob A	9/6/2000	12	68	5	Plethodon cinereus	7	0	0
75	Cabin Knob A	9/27/2000	15	60	6	Plethodon cinereus	6	0	0
76	Cabin Knob A	5/23/2001	19	55	5	Plethodon cinereus	5	0	0
79	Cabin Knob A	6/11/2001	18	62	6	Plethodon cinereus	3	0	0
82	Cabin Knob A	6/26/2001	22	23	7	Plethodon cinereus	4	0	0
86	Cabin Knob A	7/10/2001	22	59	6	Plethodon cinereus	6	0	0
87	Cabin Knob A	7/31/2001	18	65	5	Plethodon cinereus	9	0	0
91	Cabin Knob A	8/14/2001	18	70	6	Plethodon cinereus	6	0	0
93	Cabin Knob A	8/27/2001	18	68	5	Plethodon cinereus	4	0	0
94	Cabin Knob A	9/14/2001	10	68	6	Plethodon cinereus	7	0	0
97	Cabin Knob A	5/31/2002	22	69	6	Plethodon cinereus	6	0	0
99	Cabin Knob A	6/12/2002	14	80	6	Plethodon cinereus	3	0	0
101	Cabin Knob A	6/27/2002	18	45	6	Plethodon cinereus	2	0	0
102	Cabin Knob A	7/26/2002	18	68	5	Plethodon cinereus	5	0	0
105	Cabin Knob A	8/8/2002	20	65	7	Plethodon cinereus	3	0	0
107	Cabin Knob A	8/23/2002	22	50	6	Plethodon cinereus	1	0	0
110	Cabin Knob A	9/18/2002	25	65	6	Plethodon cinereus	4	0	0
112	Cabin Knob A	5/27/2003	15	50	6	Plethodon cinereus	4	0	0
136	Cabin Knob A	8/8/2002	20	65	7	Plethodon cinereus	3	0	0
65	Cabin Knob A	7/12/2000	18	70	6	Plethodon spp.	1	0	0
16	Cabin Knob B	7/26/2008	23			Eurycea bislineata	1	0	0
57	Cabin Knob B	5/11/2000				NONE	0	0	0
109	Cabin Knob B	8/23/2002	22	30	7	NONE	0	0	0
4	Cabin Knob B	8/8/2008	14	25	6	Plethodon cinereus	6	0	0
5	Cabin Knob B	7/22/2008	21	40	5	Plethodon cinereus	5	0	0
6	Cabin Knob B	7/22/2008	20	70	6	Plethodon cinereus	8	0	0
12	Cabin Knob B	6/28/2008	16	50	6	Plethodon cinereus	3	0	0
15	Cabin Knob B	7/26/2008	23			Plethodon cinereus	4	0	0
20	Cabin Knob B	6/18/2007		25	6	Plethodon cinereus	6	0	0
26	Cabin Knob B	8/30/2007	27			Plethodon cinereus	10	0	0
27	Cabin Knob B	6/16/2006	25	70	4	Plethodon cinereus	8	0	0

29	Cabin Knob B	7/14/2006		85	4	Plethodon cinereus	3	0	0
33	Cabin Knob B	8/18/2006	20	14	7	Plethodon cinereus	8	0	0
36	Cabin Knob B	9/16/2005	22	25	6	Plethodon cinereus	2	0	0
38	Cabin Knob B	6/14/2005	25	98	6	Plethodon cinereus	8	0	0
42	Cabin Knob B	7/9/2004	15	75	6	Plethodon cinereus	11	0	0
44	Cabin Knob B	6/1/2004	15	100	6	Plethodon cinereus	10	0	0
46	Cabin Knob B	9/8/2003	21	70	6	Plethodon cinereus	6	0	0
48	Cabin Knob B	7/11/2003	13	65	6	Plethodon cinereus	11	0	0
51	Cabin Knob B	6/27/2003		65	7	Plethodon cinereus	11	0	0
54	Cabin Knob B	6/18/2003	17	85	6	Plethodon cinereus	11	0	0
59	Cabin Knob B	5/22/2000				Plethodon cinereus	7	0	0
62	Cabin Knob B	6/12/2000	23	65	6	Plethodon cinereus	6	0	0
64	Cabin Knob B	6/21/2000	20			Plethodon cinereus	6	0	0
66	Cabin Knob B	7/12/2000				Plethodon cinereus	11	0	0
69	Cabin Knob B	8/9/2000	22	52	6	Plethodon cinereus	7	0	0
71	Cabin Knob B	8/22/2000	18	45	6	Plethodon cinereus	12	0	0
73	Cabin Knob B	9/6/2000	13	65	6	Plethodon cinereus	4	0	0
74	Cabin Knob B	9/27/2000	14	68	6	Plethodon cinereus	8	0	0
77	Cabin Knob B	5/23/2001	22	55	5	Plethodon cinereus	2	0	0
80	Cabin Knob B	6/11/2001	20	68	5	Plethodon cinereus	15	0	0
83	Cabin Knob B	6/26/2001	24	50	7	Plethodon cinereus	8	0	0
85	Cabin Knob B	7/10/2001	25	82	5	Plethodon cinereus	14	0	0
88	Cabin Knob B	7/31/2001	20	60	5	Plethodon cinereus	8	0	0
89	Cabin Knob B	8/14/2001	20	95	4	Plethodon cinereus	8	0	0
92	Cabin Knob B	8/27/2001	19	69	5	Plethodon cinereus	6	0	0
95	Cabin Knob B	9/14/2001	11	50	7	Plethodon cinereus	5	0	0
96	Cabin Knob B	5/31/2002	30	80	6	Plethodon cinereus	9	0	0
98	Cabin Knob B	6/13/2002	15	50	7	Plethodon cinereus	3	0	0
100	Cabin Knob B	6/27/2002	20	55	6	Plethodon cinereus	3	0	0
103	Cabin Knob B	7/26/2002	17	68	5	Plethodon cinereus	8	0	0
106	Cabin Knob B	8/8/2002	20	71	6	Plethodon cinereus	2	0	0
111	Cabin Knob B	9/18/2002	22	50	6	Plethodon cinereus	7	0	0
113	Cabin Knob B	5/27/2003	14	65	6	Plethodon cinereus	7	0	0
39	Cabin Knob B	6/14/2005	25	98	6	Plethodon nettingi	1	638023	4320705
43	Cabin Knob B	7/9/2004	15	75	6	Plethodon nettingi	1	638023	4320705
49	Cabin Knob B	7/11/2003	13	95	6	Plethodon nettingi	1	638023	4320705
52	Cabin Knob B	6/27/2003		65	7	Plethodon nettingi	1	638023	4320705

55	Cabin Knob B	6/18/2003	17	85	6	Plethodon nettingi	1	638023	4320705
60	Cabin Knob B	5/22/2000				Plethodon nettingi	1	638023	4320705
67	Cabin Knob B	7/12/2000				Plethodon nettingi	1	638023	4320705
78	Cabin Knob B	5/23/2001	22	55	5	Plethodon nettingi	1	638023	4320705
81	Cabin Knob B	6/11/2001	20	68	5	Plethodon nettingi	1	638023	4320705
84	Cabin Knob B	6/26/2001	22	80	6	Plethodon nettingi	1	638023	4320705
90	Cabin Knob B	8/14/2001	20	95	4	Plethodon nettingi	1	638023	4320705
104	Cabin Knob B	7/26/2002	17	68	5	Plethodon nettingi	1	638023	4320705
156	Cabin Knob B	7/26/2007	23			Plethodon nettingi	1	638023	4320705