

PROJECT: Wood frog survey along the McCarthy Road, 1991-1993.

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Many amphibian populations are declining over broad geographic regions world wide (Barinaga 1990, Blaustein and Wake 1990, Phillips 1990, Wyman 1990). A number of factors may be contributing to these declines, including habitat destruction, pollution, global climate change, ultraviolet radiation, habitat fragmentation, disease, introduction of exotic species, and acidification of wetland habitats (Wyman 1990, Blaustein 1993). Unfortunately, most of the reports on declining amphibian populations are based on anecdotal information. Lack of long-term population trend data makes it difficult to assess the significance of these declines (Blaustein 1993).

Amphibians serve as good indicators of environmental health. Their permeable skin and exposed egg masses are sensitive to pollution, ultraviolet radiation, and acidification in breeding habitats. Additionally, the life cycles of many species make them susceptible to environmental stresses in both aquatic and terrestrial environments (Blaustein 1993).

The purpose of this study was to document which species were present along the McCarthy Road and their relative abundance.

STUDY AREA

The study area included the entire length of the McCarthy Road from Chitina to McCarthy. The McCarthy Road was divided into 5 drainages (Kotsina, Kuskulana, Gilahina, Lakina, and Tractor). Wetland areas that were accessible from the road were numbered within each drainage. Ten wetland areas were randomly chosen for the survey, 2 from each drainage (Figs. 1-4).

Suitable breeding habitat for frogs was limited in the Tractor drainage, resulting in only 1 wetland being chosen from that area. An additional wetland was chosen from the adjacent Lakina drainage to compensate for the loss in the Tractor drainage. L-3 (Long Lake) is a deep lake with a steep shoreline. Suitable breeding habitat was limited. It was replaced with L-2 (Crystal Lake) in 1992.

METHODS

We surveyed frogs along the McCarthy Road during 1991-1993 using calling surveys developed by Anderson et al (1981). Type of water area, location, date, time, air and water temperatures, calling species, and relative abundance were recorded at each survey site (Fig. 5). Observers listened for a minimum of 5 minutes at each site. Type of water area was defined as lake,

pond, or deep marsh according to the following definitions (Benyus 1989):

Lake - Permanent open water greater than 10 acres and usually deeper than 6 feet.

Pond - Permanent open water less than 10 acres and usually less than 6 feet.

Deep Marsh - A shallow basin with 6 inches to 3 feet of standing water throughout much of the year. Herbaceous aquatic plants grow throughout the marsh.

During 1991, we surveyed during night hours (2200-0117 hours) to document which species were present since all potential frog species for this area call at night (Anderson et al 1981). In 1992 and 1993, we conducted surveys during daylight hours since wood frogs were the only species documented in 1991 and although they call at night, they are primarily active during daylight hours (Anderson et al 1981).

In 1993, we also checked for and measured any egg masses found near survey stations to get an index on reproduction. Egg masses usually occur close to the shore line in 0.5-1 feet of water. We counted the number of egg masses seen and measured volume (Length x Width x Height). This is more accurate than just counting the number of masses since some frogs all lay eggs in one mass while others lay their eggs separately in smaller masses (J Lindell, US Fish & Wildlife Service, pers commun).

We also made an attempt to check for new species by setting 4 minnow traps baited with clams at 2 ponds along the Old Edgerton Highway on May 18-21, 1993. The traps were placed half in and half out of the water in emergent vegetation close to shore. They were checked daily.

RESULTS AND DISCUSSION

Wood frogs were the only species documented during 1991-1993 calling surveys. No amphibians were captured in minnow traps during May 18-21, 1993.

The relative abundance of wood frogs along the McCarthy Road is not comparable between years due to differences in the time and dates of the surveys (Table 1). The short calling period of the wood frog (2 weeks) made it difficult to time surveys. In 1992, for example, we delayed surveys due to a very late spring but were too late for surveying wood frogs. Further, optimal survey dates vary between the east and west ends of the McCarthy Road and are probably related to differences in elevation (Table 2). Based on the data collected, the survey should be split into 2 routes. The west route (KU-6, KU-1, KO-5, KO-3) should be run late in the first week of May and the east route (T-3, L-6, L-2, L-1, G-7, G-1) should be run about mid May. More survey sites

could be added to each route if 2 routes were run or one route could be deleted if there are time constraints. Frog surveys should be run annually to detect changes in population abundance. Once every 3-5 years is probably adequate for a presence/absence inventory.

We had some disagreement between observers in indexing the relative abundance as either 2 or 3. The observer should be instructed to make notes when they have difficulty deciding abundance. It should also be noted that this method is a gross indicator of change in population abundance and is probably not useful in detecting small population fluctuations.

Table 1. Data collected on the relative abundance of the wood frog along the McCarthy Road 1991-1993.

DATE	TIME	LOCATION	TEMPERATURE (C)		RELATIVE ABUNDANCE	EGG MASSES
			WATER	AIR		
5/20/91	2203	T-3	7	13	2	NO
5/29/92	1447	T-3	10	--	0	
5/13/93	1251	T-3	11	19	1	
5/20/91	----	L-6	13	--	2	NO
5/29/92	1503	L-6	16	23	1	
5/13/93	1345	L-6	11	23	2	
5/20/91	2247	L-3	3	--	0	NO
5/29/92	1527	L-3	13	24	0	
5/13/93	1410	L-3	1	20	0	
5/29/92	1548	L-2	16	20	0	NO
5/13/93	1429	L-2	13	20	3	
5/20/91	----	L-1	15	--	1	NO
5/29/92	1611	L-1	17	23	0	
5/13/93	1440	L-1	9	20	3	
5/20/91	2331	G-7	14	--	2	NO
5/29/92	1628	G-7	16	--	0	
5/13/93	1458	G-7	16	21	2	
5/21/91	0003	G-1	13	--	2	NO
5/29/92	1658	G-1	14	21	1	
5/13/93	1540	G-1	16	21	2	
5/21/91	0027	KU-6	9	--	2	NO
5/29/92	1716	KU-6	19	17	1	
5/13/93	1616	KU-6	9	18	1	
5/21/91	0055	KU-1	13	--	1	YES ^a
5/29/92	1738	KU-1	15	20	1	
5/13/93	1650	KU-1	15	19	1	
5/21/91	0109	KO-5	16	--	1	NO
5/29/92	1758	KO-5	19	21	0	
5/13/93	1702	KO-5	13	24	1	
5/20/91	0117	KO-3	14	9	1	NO
5/29/92	1803	KO-3	17	--	0	
5/13/93	1713	KO-3	16	20	1	

^a Two egg masses were found. One measured 2" x 1.75" x 1" and the second measured 1.5" x 1" x 1.75".

Table 2. Habitat parameters at surveys sites for wood frogs along the McCarthy Road.

LOCATION	HABITAT TYPE	ELEVATION	LATITUDE	LONGITUDE
T-3	Deep Marsh	1580		
L-6	Pond	1630		
L-3	Lake	1480		
L-2	Lake	1400		
L-1	Lake	1395		
G-7	Lake	1457		
G-1	Pond	1530		
KU-6	Pond	1300		
KU-1	Pond	1250		
KO-5	Pond	1200		
KO-3	Pond	1250		

We only found egg masses in 1 pond, KU-1. This was probably related to breeding phenology and habitat. The frogs breeding in wetland areas on the east section of the McCarthy Road (G-1 through T-3) probably did not yet lay eggs. KU-1 was the only pond on the west section of the road that had emergent vegetation along the shoreline. Adequate habitat near the survey point may have influenced the presence of egg masses.

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