



United States Department of the Interior

NATIONAL PARK SERVICE
Jewel Cave National Monument
11149 U.S. Highway 16
Custer, South Dakota 57730

IN REPLY REFER TO:

January 20, 2011

Memorandum

To: JECA Central Files

From: Dan Austin, Physical Science Technician

Subject: Jewel Cave Winter Bat Survey

On January 20, 2011, the annual hibernating bat count was conducted at Jewel Cave. Rene Ohms, Dan Austin, Mike Wiles and Brad Phillips participated in the count.

We conducted the survey following a protocol that has been used at Jewel Cave since 1992. Two search routes were surveyed: one extending from the Milk River gate to the cave entrance (Heavenly Route); the second extending from the Dungeon Room to Surveyor's Hall (Dungeon Route). Attached are copies of the maps used, with the specific search areas indicated.

We began the count at 9:00 a.m. and split into two groups. Each search group proceeded to the end of their assigned route, then counted back toward the entrance. The Dungeon Route group (Rene and Dan) finished at 9:50 a.m., and the Heavenly Route group (Brad and Mike) finished at 11:15 a.m.

Corynorhinus (620), *Myotis* (542), and *Eptesicus* (2) were found. When possible, the *Myotis* were identified to species. Each bat was counted, although numbers roosting in large clusters were estimated. Many bats may have been overlooked, particularly those that roost in small cracks, such as *M. ciliolabrum*. Temperature and relative humidity readings were taken in each numbered search area.

A total of 1,164 bats were counted. There were 677 bats along the Dungeon Route (COTO=342; MYOT=335; EPFU = 0) and 487 bats along the Heavenly Route (COTO=278; MYOT=207; EPFU = 2). Overall, 221 fewer bats were counted this year than in 2008-2009. The greatest number of bats in a search area was 280 *Corynorhinus* in the Trap Door Room area, and the largest cluster (40 *Corynorhinus*) was also in the Trap Door Room area.

The temperature recorded just outside the cave entrance was 21.7°F, and the cave was inhaling.

cc: Larry Johnson, JECA
JECA Interpretation
Joel Tigner

Mike Wiles, JECA
Brad Phillips, USFS
Rene Ohms, JECA

SUMMARY OF BAT COUNT RECORDS FOR JEWEL CAVE, 1950s TO PRESENT

<u>Year</u>	<u><i>C. townsendii</i></u>	<u><i>Myotis sp.</i></u>	<u><i>E. fuscus</i></u>	<u><i>P. subflavus</i></u>	<u>Total</u>
pre-1959					3500-4000 - reference in letter (anecdotal)
12/29/59-3/18/60	1137	unknown			1137 1137 COTO banded*
12/22-12/30/60	544	unknown			544 544 COTO banded*
12/28-12/29/61	291				291 291 COTO banded*
					(Total of 1,972 banded, 1959-61)
1967/68	600	unknown			604 (including at least 4 <i>M. ciliolabrum</i> and an unknown # of <i>M. volans</i>)
1969/70	1000	280			1280
1986/87	728	545			1273
1988/89	614	492			1106
1989/90	831	445			1276

New methodology established in 1992:

1992/93	1187	181			1368
1993/94	791	389			1180
1994/95	895	356			1251
1995/96	721	432			1153
1996/97	730	398**			1128
1997/98	593	479			1072
1998/99	901	454			1355
1999/00	853	466		2?	1321
2000/01	708	435			1143
2001/02	721	445		2	1168
2002/03	1135	470			1605
2003/04	886	457		2	1345
2004/05	1060	493		1? 1?	1555
2005/06	928	443		11	1382
2006/07	750	595		6	1351
2007/08	877	442			1319
2008/09	921	460		4	1385
2009/10	No count conducted this year				N/A
2010/11	620	542		2	1164

* Banding records are held by National Biological Service, Patuxent Wildlife Research Center at the National Museum of Natural History in Washington DC. (They have the original banding cards).

** Deep Canyon was not counted in 1996/97.

DUNGEON ROUTE COUNT, 2011

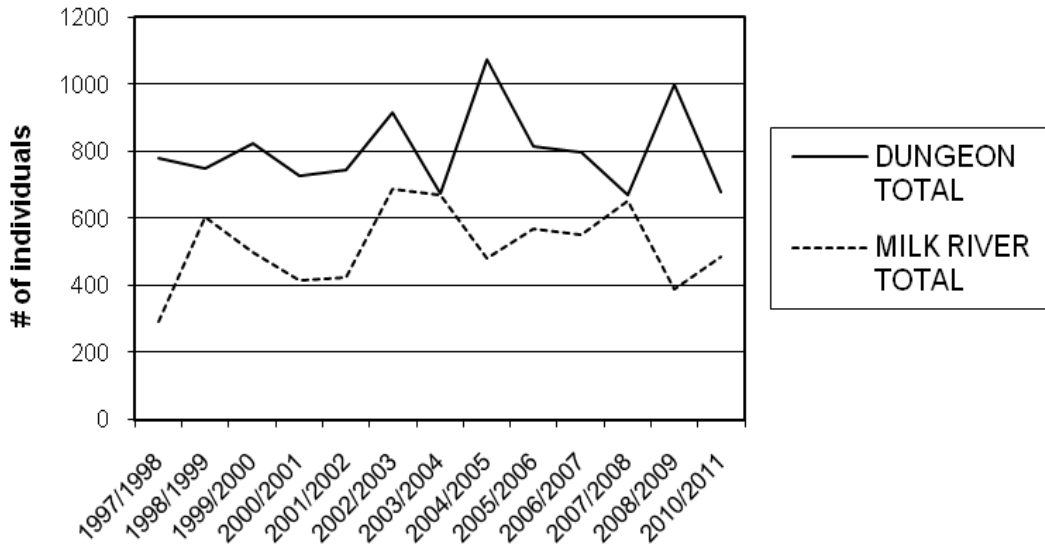
Survey Area	Temp	RH-%	Genus/Count	# in clusters	bats/cluster	avg/cluster	singles
Area #1:	27	44%	COTO = 5 MYOT = 3	3 in 1	3		2 3
Area #2:	35	54%	COTO = 281 MYOT = 0	269 in 21	3-40	12.8	11 0
Area #3:	39	61%	COTO = 49 MYOT = 2	43 in 6	3-11	7.1	6 2
Area #4:	41	69%	COTO = 8 MYOT = 1	2 in 1	2		6 1
Area #5:	42	77%	COTO = 0 MYOT = 1				0 1
Area #6:	44	91%	COTO = 0 MYOT = 328	[4 species]			0 ?
Area #7:	18	60%	COTO = 0 MYOT = 0				0 0
Lantern Room:	25	64%	COTO = 0 MYOT = 0				0 0
TOTAL for Dungeon Route			COTO = 342 MYOT = 335	317 in 29	3-40	9.9	25

in clusters = total number of bats in clusters and total number of clusters (i.e., 41 in 5 means 41 bats in five clusters)
bats/cluster = size range of clusters
avg/cluster = average number of bats per cluster
singles = number of bats roosting singly

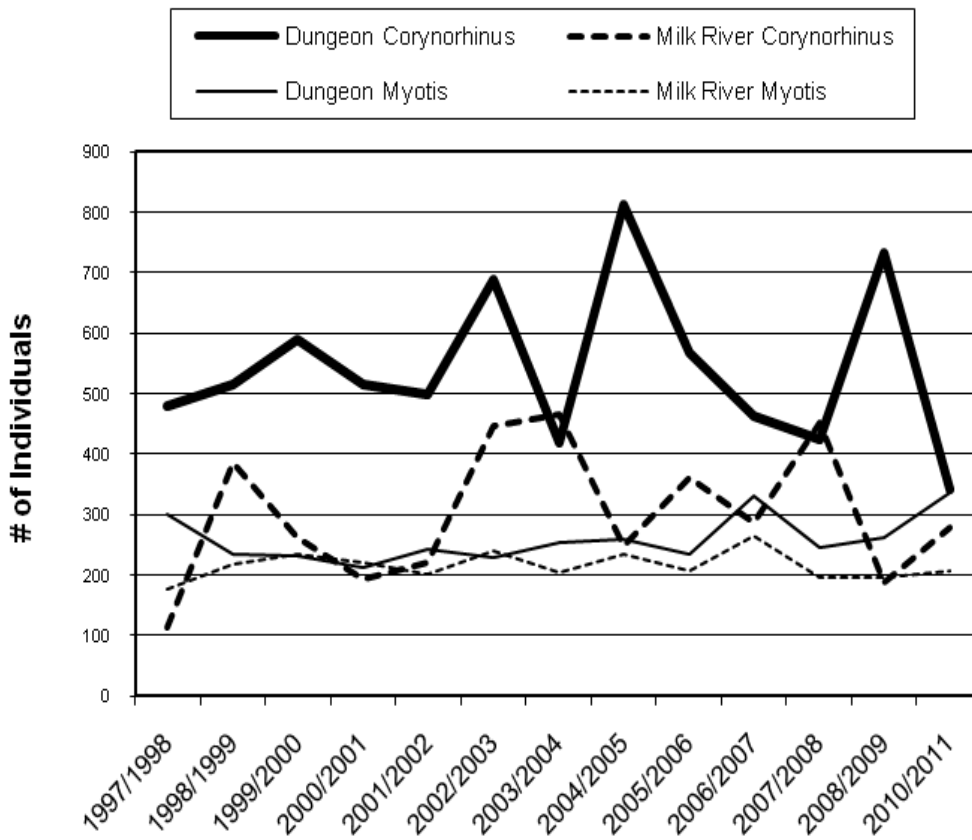
HEAVENLY ROUTE COUNT, 2011

Survey Area	Temp	RH-%	Genus/Count	# in clusters	bats/cluster	avg/cluster	singles
Area #8:	27	56%	COTO = 15 MYOT = 0	13 in 1	13		2 0
Area #9:	33	67%	COTO = 12 MYOT = 0	2 in 1	2		10 0
Area #10:	36	61%	COTO = 5 MYOT = 0	3 in 1	3		2 0
Area #11:	36	59%	COTO = 108 MYOT = 3	93 in 15	2-17	6.2	15 3
Area #12:	37	56%	COTO = 22 MYOT = 0	11 in 3	3-6	3.6	16 0
Area #13:	37	59%	COTO = 45 MYOT = 0	32 in 4	6-10	8	13 0
Area #14:	39	59%	COTO = 14 MYOT = 0	2 in 1	2		12 0
Area #15:	39	56%	COTO = 47 MYOT = 0	29 in 7	2-10	4.1	11 0
Area #16:	42	56%	COTO = 2 MYOT = 4				2 4
Area #17:	48	54%	COTO = 1 MYOT = 0				1 0
Area #18:	41	82%	COTO = 0 MYOT = 181	132 in 25	2-11	5.2	0 49
Area #19:	40	64%	COTO = 6 MYOT = 13 EPFU = 2				7 13 2
Area #20:	41	68%	COTO = 1 MYOT = 3	2 in 1	2		1 1
Area #21:	42	79%	COTO = 0 MYOT = 1				0 1
Area #22:	44	95%	COTO = 0 MYOT = 2	2 in 1	2		0 0
Area #23:	42	79%	COTO = 0 MYOT = 0				0 0
TOTAL for Heavenly Route			COTO = 278 MYOT = 207 EPFU = 2	185 in 33 136 in 27	2-17 2-11	5.4 5.2	92 71 2

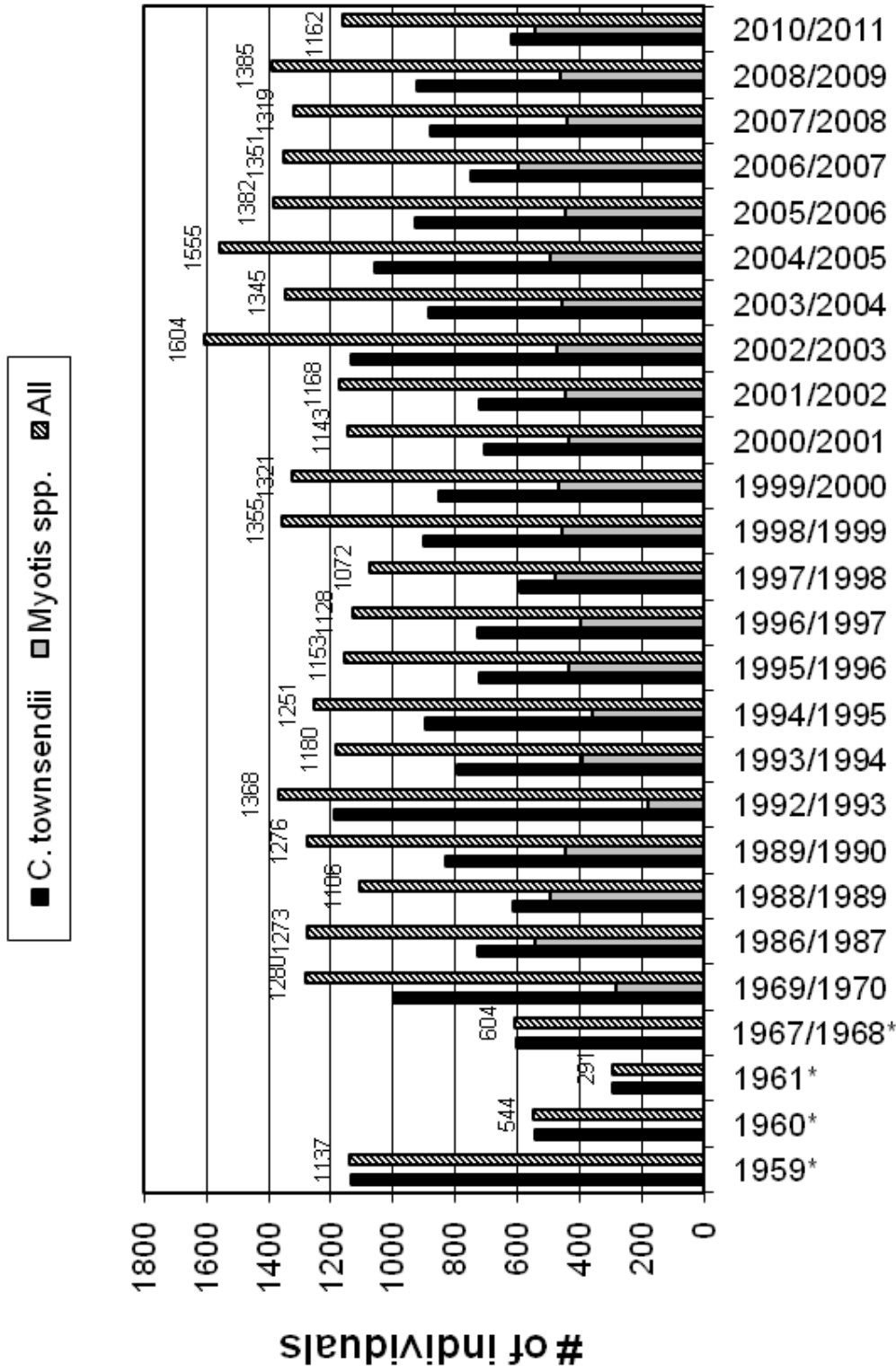
Bat Count Totals By Route



Corynorhinus and Myotis by Route



Jewel Cave Bat Count Results (1959 to 2011)



*Myotis numbers unknown 1959-1968

Dungeon Room

#6

Dungeon Route

Updated October 2002

6↓ = # of stairs up or down (as you go in)

#5

#4

Chert Room

Rock steps
3↑

#3

Fat Man's
Misc

#1

Catacombs

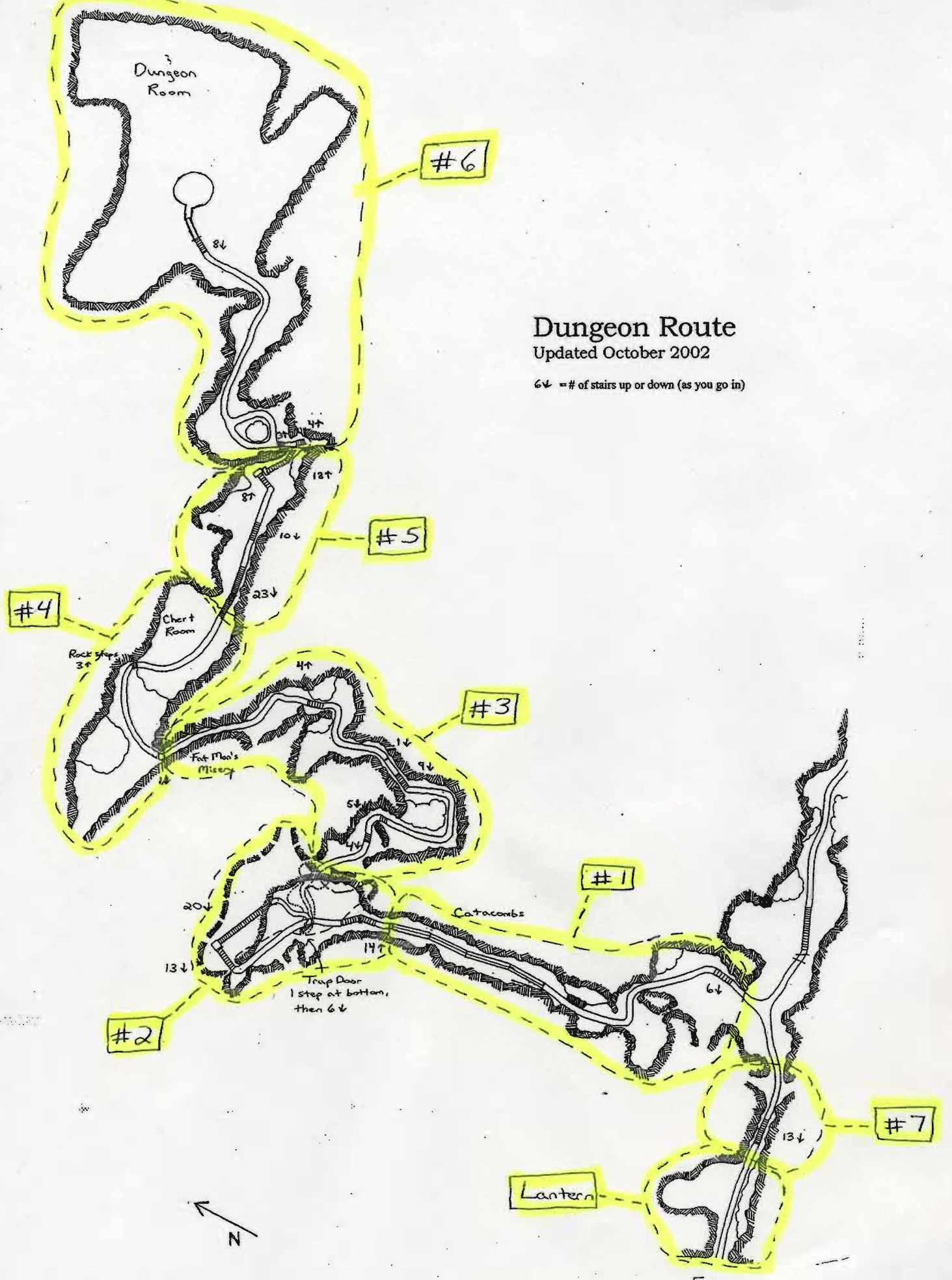
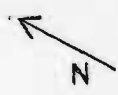
#2

Trap Door
1 step at bottom,
then 6↓

#7

Lantern

Entrance



Heavenly Route

Updated October 2002

↕ = # of stairs up or down (as you go in)

