

**Supplementary Table 2**

The known parameters of unmarked abundance ( $U$ ) and capture probability ( $p$ ) used to produce the number of individuals caught ( $u$ ), the number of individuals released upstream ( $n$ ), and the number of individuals recaptured ( $m$ ) for the first year of each simulated data set. Data scenarios may have excluded data for 4 or 8 temporal strata and may have reduced the number of marked and recaptured individuals by 60% across all strata. NA=not available.

Strata	Known parameters		Full			4 strata			4 strata 60% reduction			8 strata 60% reduction		
	$U$	$p$	$u$	$n$	$m$	$u$	$n$	$m$	$u$	$n$	$m$	$u$	$n$	$m$
1	132	0.3333	44	44	15	44	44	15	44	18	6	44	18	6
2	157	0.3333	52	50	17	52	50	17	52	20	7	52	20	7
3	231	0.3333	77	50	17	77	50	17	77	20	7	77	20	7
4	376	0.3333	125	50	17	125	50	17	125	20	7	125	20	7
5	546	0.1111	61	50	6	NA	NA	NA	NA	NA	NA	61	20	2
6	625	0.1111	69	50	6	NA	NA	NA	NA	NA	NA	69	20	2
7	546	0.1111	61	50	6	NA	NA	NA	NA	NA	NA	61	20	2
8	376	0.1111	42	42	5	NA	NA	NA	NA	NA	NA	42	17	2
9	231	0.1111	26	26	3	26	26	3	26	10	1	26	10	1
10	157	0.1111	17	17	2	17	17	2	17	7	1	17	7	1
11	132	0.1111	15	15	2	15	15	2	15	6	1	NA	NA	NA
12	150	0.1111	17	17	2	17	17	2	17	7	1	NA	NA	NA
13	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
14	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
15	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
16	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
17	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
18	150	0.3333	50	50	17	50	50	17	50	20	7	NA	NA	NA
19	150	0.3333	50	50	17	50	50	17	50	20	7	50	20	7
20	150	0.3333	50	50	17	50	50	17	50	20	7	50	20	7
21	424	0.3333	141	50	17	141	50	17	141	20	7	141	20	7
22	620	0.3333	207	50	17	207	50	17	207	20	7	207	20	7
23	884	0.3333	295	50	17	295	50	17	295	20	7	295	20	7
24	1200	0.3333	400	50	17	400	50	17	400	20	7	400	20	7
25	1536	0.3333	512	50	17	512	50	17	512	20	7	512	20	7
26	1838	0.3333	613	50	17	613	50	17	613	20	7	613	20	7
27	2049	0.3333	683	50	17	683	50	17	683	20	7	683	20	7
28	2125	0.3333	708	50	17	708	50	17	708	20	7	708	20	7
29	2049	0.3333	683	50	17	683	50	17	683	20	7	683	20	7
30	1838	0.3333	613	50	17	613	50	17	613	20	7	613	20	7
31	1536	0.3333	512	50	17	512	50	17	512	20	7	512	20	7
32	1200	0.3333	400	50	17	400	50	17	400	20	7	400	20	7
33	884	0.3333	295	50	17	295	50	17	295	20	7	295	20	7
34	620	0.3333	207	50	17	207	50	17	207	20	7	207	20	7
35	424	0.3333	141	50	17	141	50	17	141	20	7	141	20	7