

Appendix A. Campsite Area Data for Each Study Site

Campsite name: Jackass

River mile: 8.1, River Left

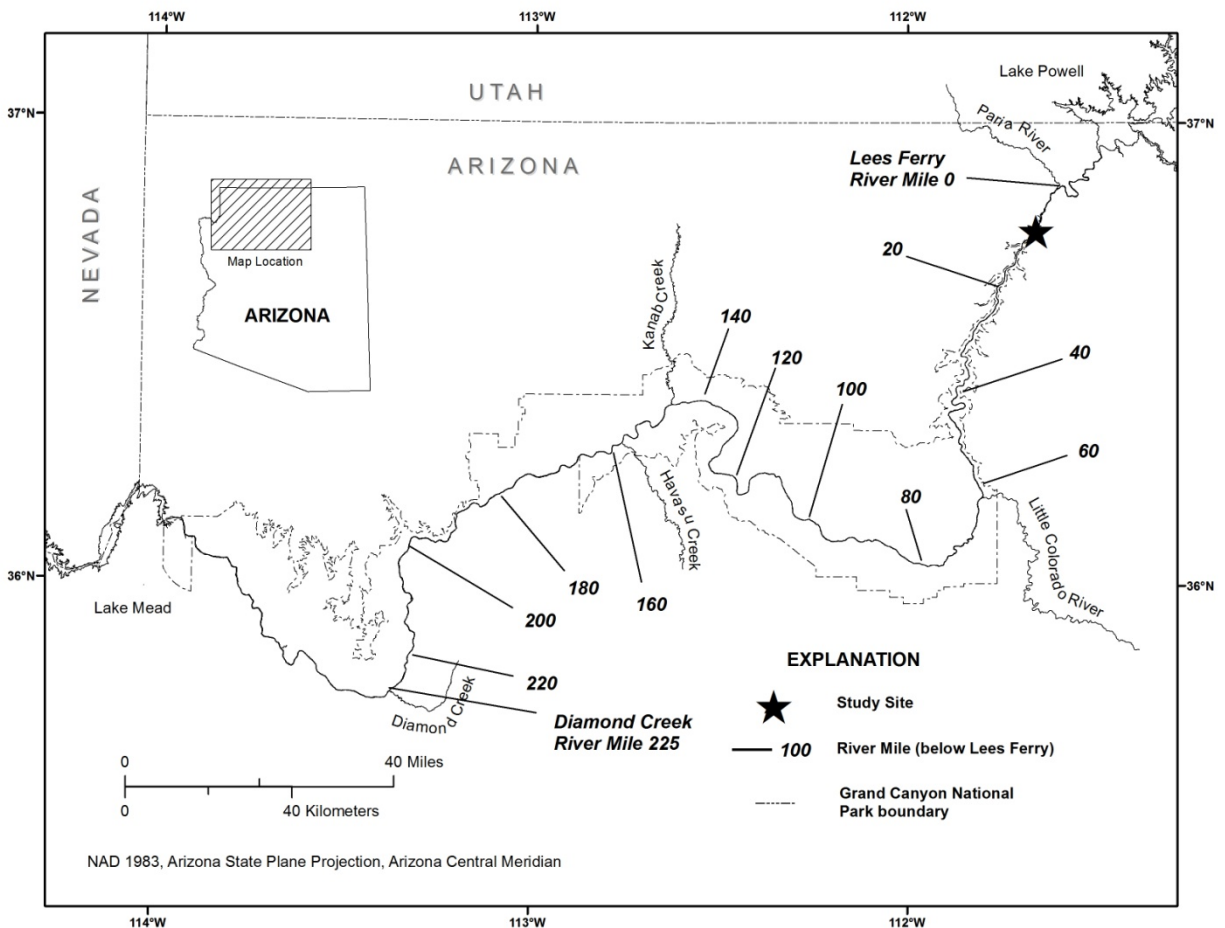


Figure A1. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Jackass camp study site (river mile 8.1L).

Table A1. Campsite area in different stage-elevation zones at Jackass camp (River Mile 8.1L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey date	Campsite area								
	Stage-elevation zones ¹								
	10–15 (m ²)	15–20 (m ²)	20–25 (m ²)	25–30 (m ²)	30–45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/3/1999		0	47	216	528	327	47	1071	1118
10/5/2001	0	81	393	118	365	126	474	609	1083
9/20/2002	0	89	258	78	129	30	347	237	584
4/25/2003	0	16	178	129	218	166	194	513	707
9/20/2003	0	48	265	204	195	69	313	468	781
5/7/2005	12	240	110	354	246	77	704	677	1027
10/7/2006	0	12	185	234	189	37	197	460	657
10/13/2007	0	89	140	161	87	32	229	280	509
2/2/2008	0	80	178	255	163	44	258	463	721
3/28/2008	0	75	32	179	142	36	107	357	464
10/11/2008	2	166	221	259	105	6	387	370	757
10/10/2009	22	92	233	236	79	8	325	324	648
10/5/2011		161	230	176	73	0	392	249	641
10/3/2012	69	84	239	149	42	7	323	198	520

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

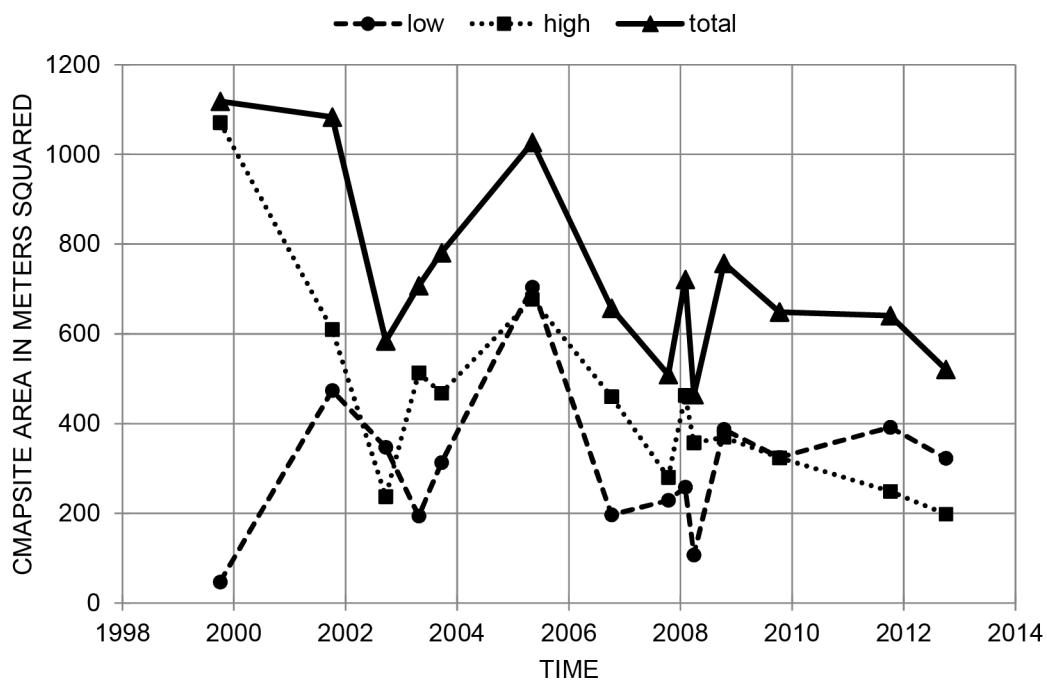
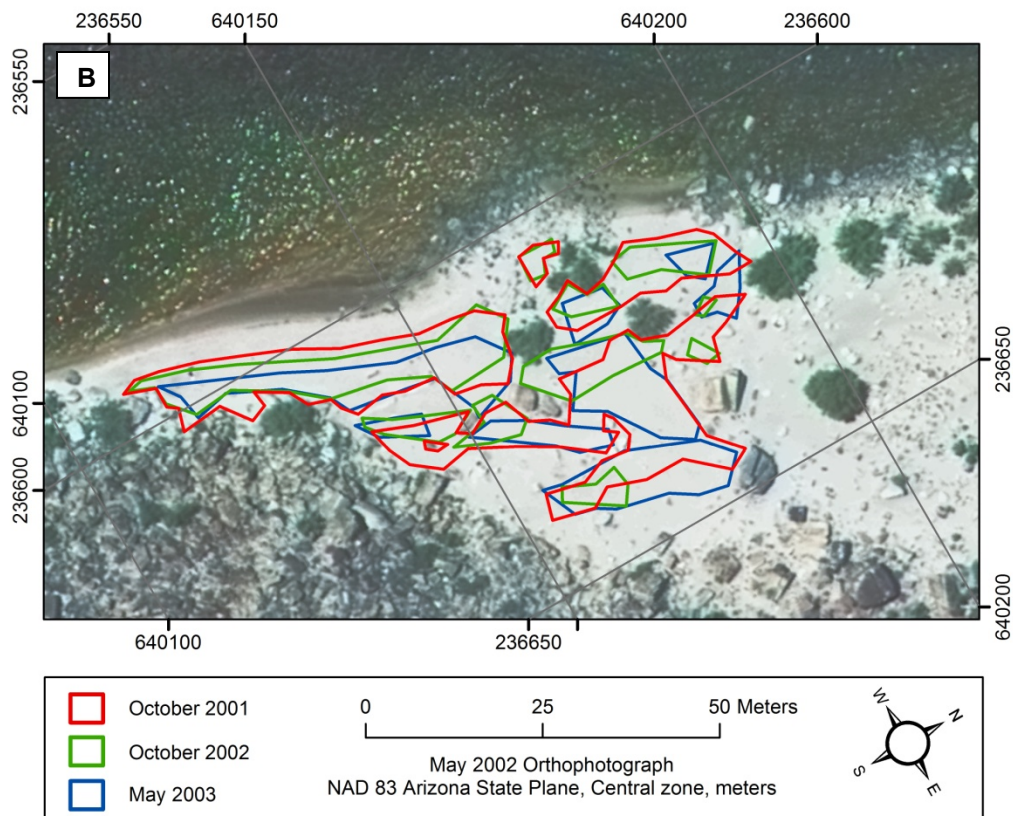
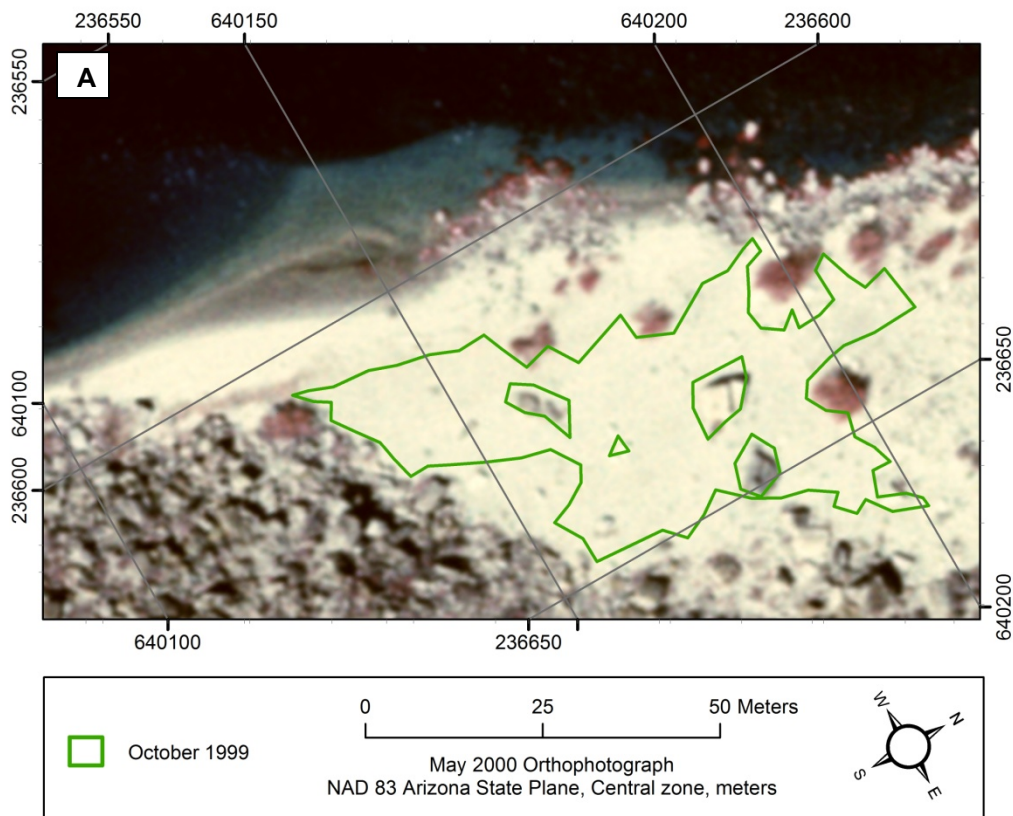
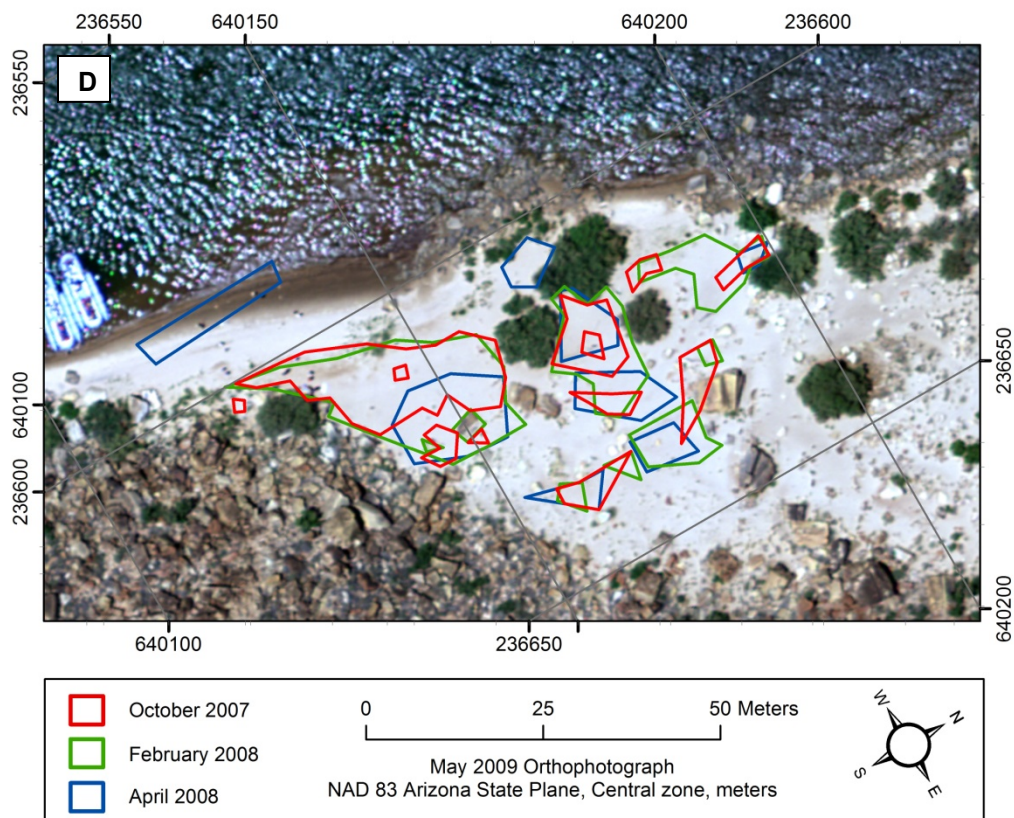
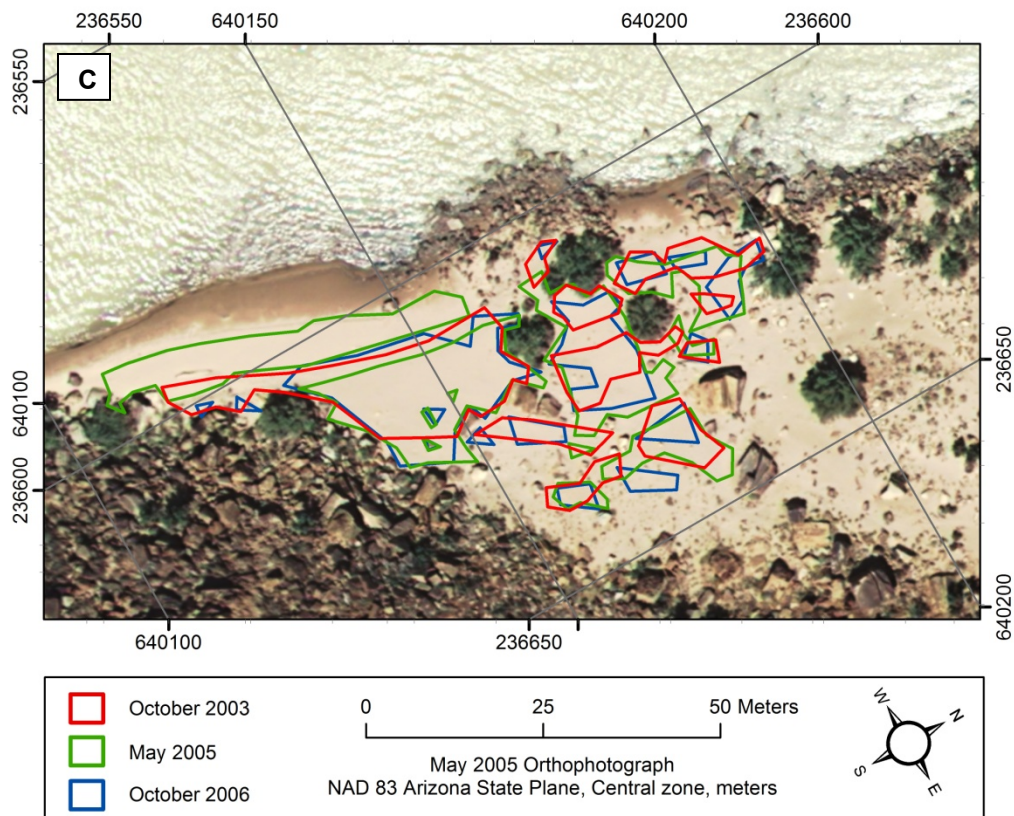


Figure A2. Time series plot showing campsite area at Jackass camp (River Mile 8.1L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A1 for data.





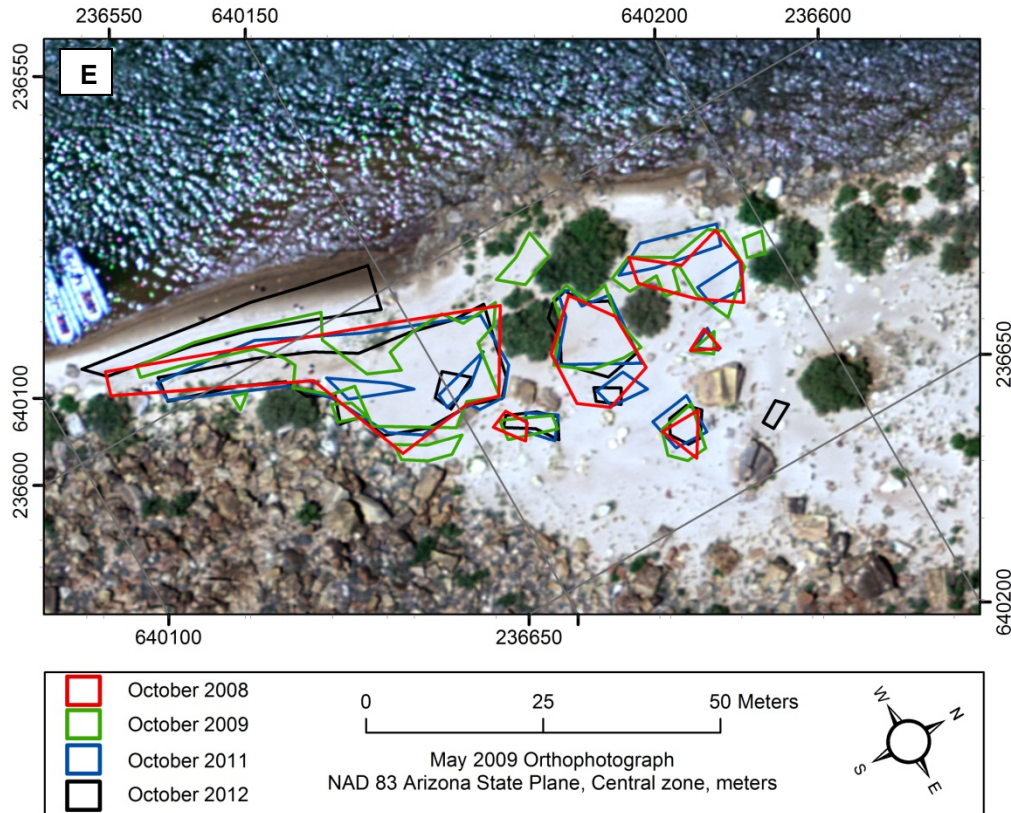


Figure A3. Maps showing campsite areas measured at Jackass camp (River Mile 8.1L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A4. Remote-camera photographs showing Jackass camp at River Mile 8.1L. Flow in main channel is from left to right. (A) Photograph taken on October 14, 1998; (B) photograph taken on October 3, 2012.

Campsite Name: Hot Na Na
River Mile: 16.6, River Left

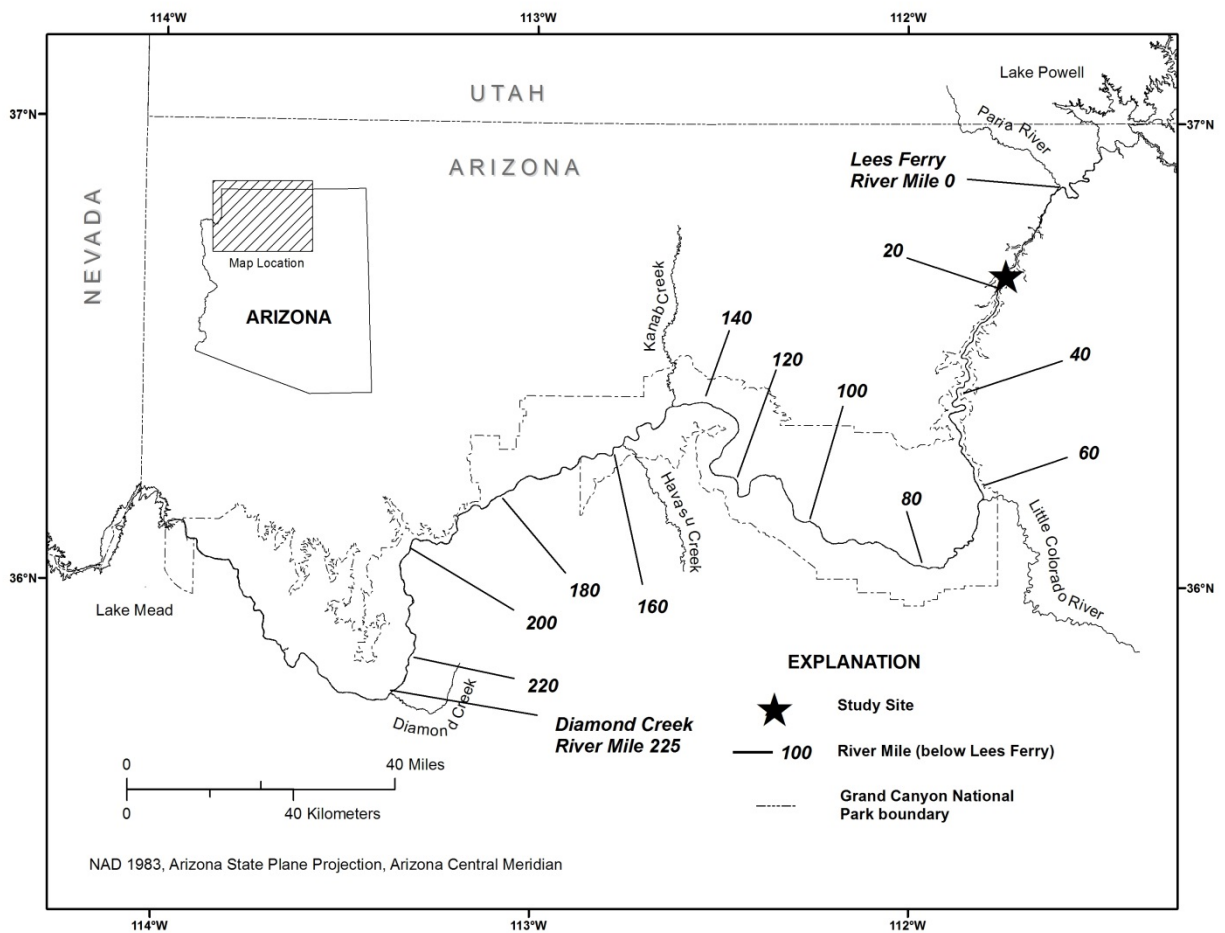


Figure A5. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Hot Na Na camp study site (River Mile 16.6L).

Table A2. Campsite area in different stage-elevation zones at Hot Na Na camp (River Mile 16.6L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/10/1998		0	146	55	306	169	146	530	676
10/4/1999		0	111	35	337	131	111	503	614
10/15/2000	32	195	115	29	399	112	310	540	850
10/6/2001	30	126	104	12	54	81	230	147	377
9/21/2002	9	2	75	7	74	64	77	145	222
4/25/2003	0	0	58	0	44	20	58	64	122
9/21/2003	0	3	65	3	103	71	68	177	245
5/8/2005	58	203	250	4	188	68	453	260	713
10/8/2006	45	68	113	1	178	85	181	264	445
10/14/2007	1	23	89	0	189	49	112	238	350
2/3/2008	4	124	92	0	208	61	216	269	485
3/29/2008	0	102	261	102	32	184	363	318	681
10/12/2008	0	77	222	0	119	154	299	273	572
10/11/2009	0	164	72	0	29	97	236	126	361
10/6/2011		0	0	18	219	76	0	314	314
10/4/2012	251	383	114	33	182	110	497	324	821

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

Above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

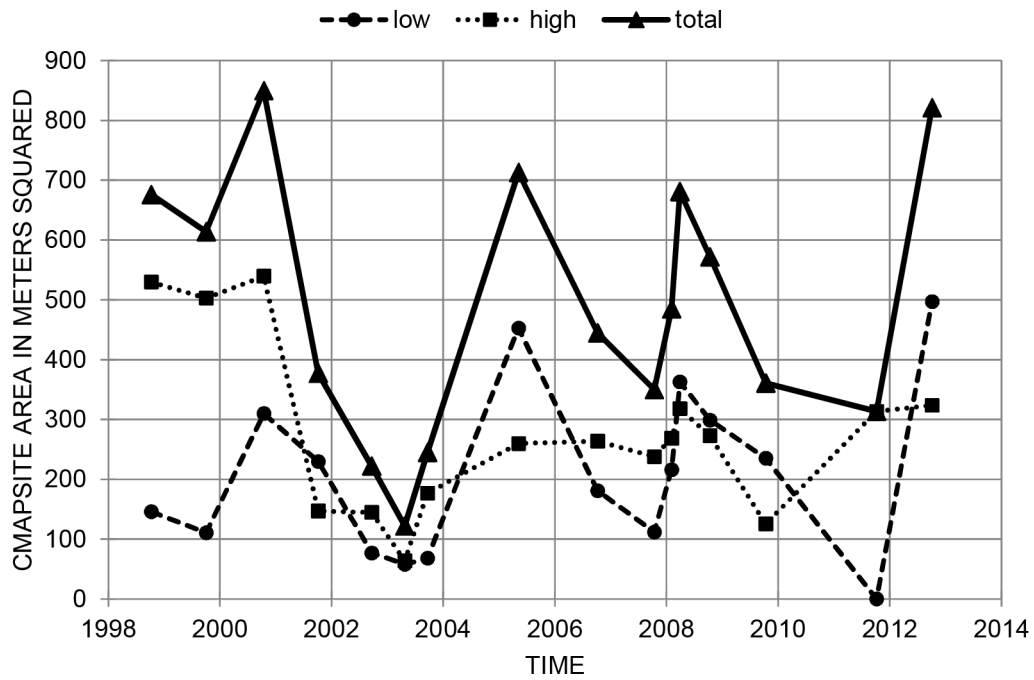
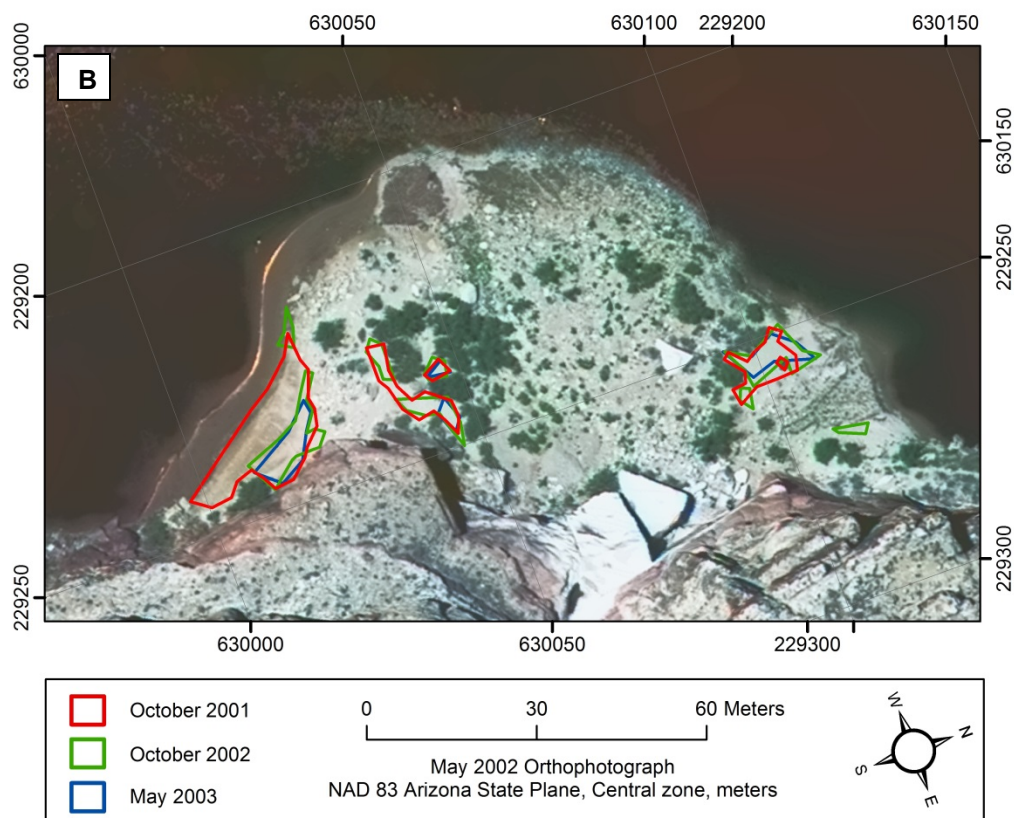
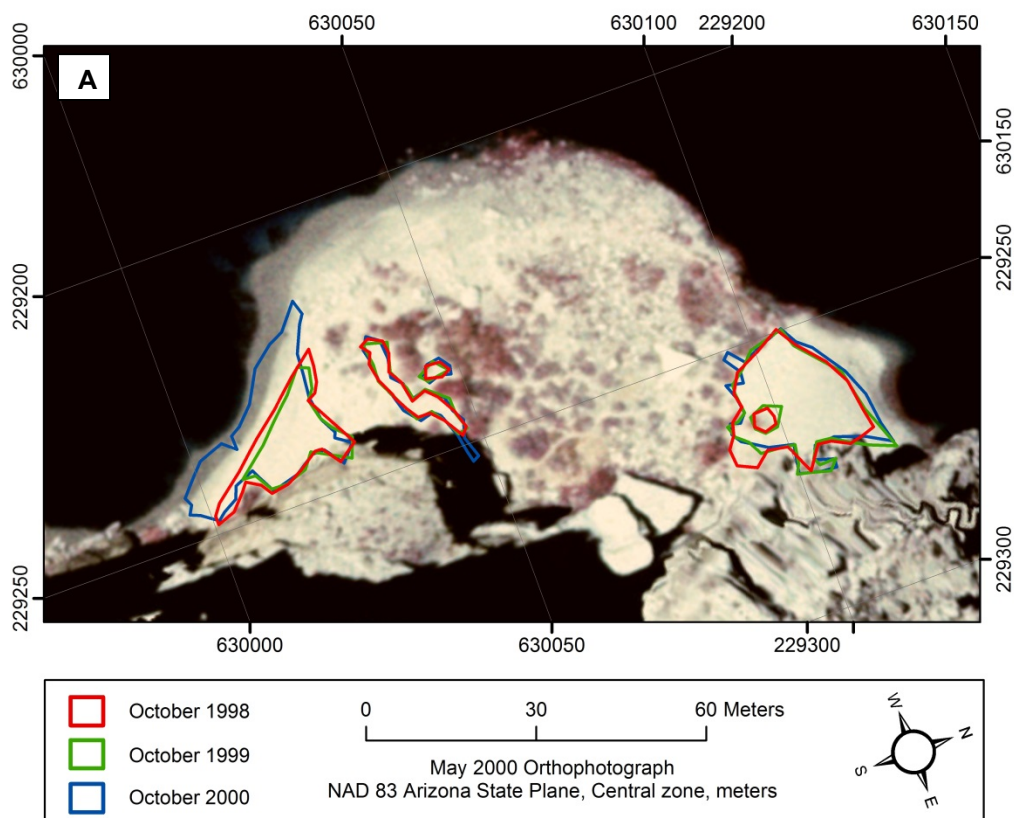
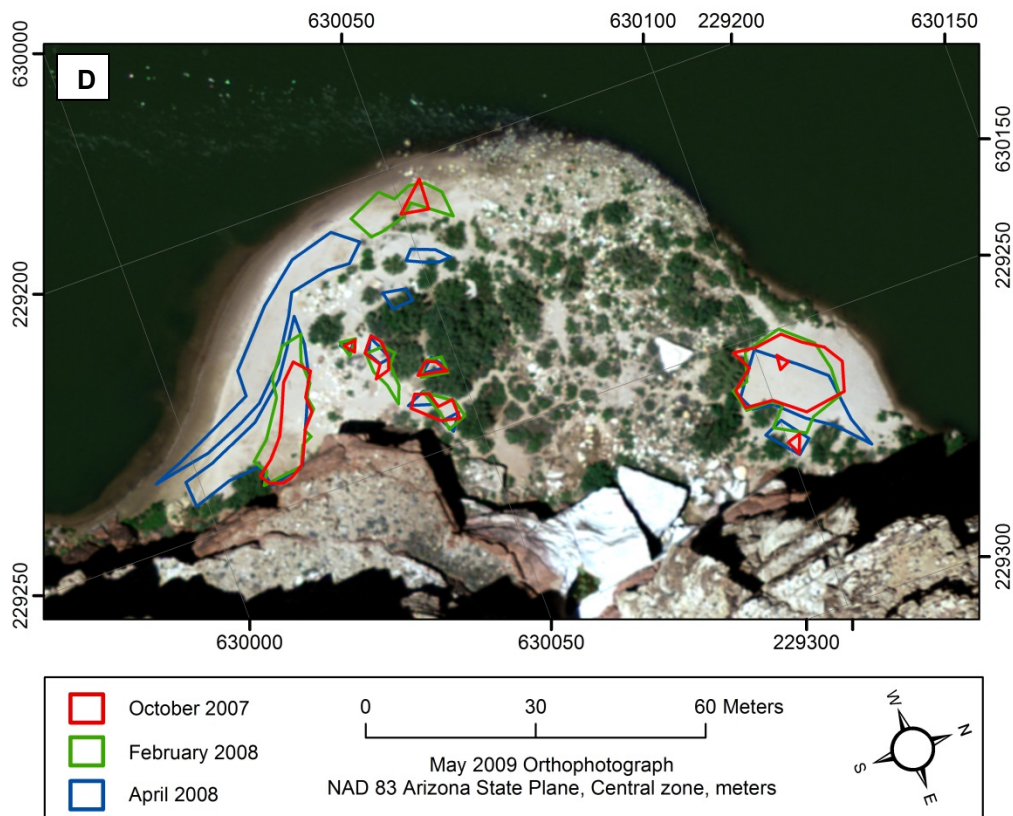
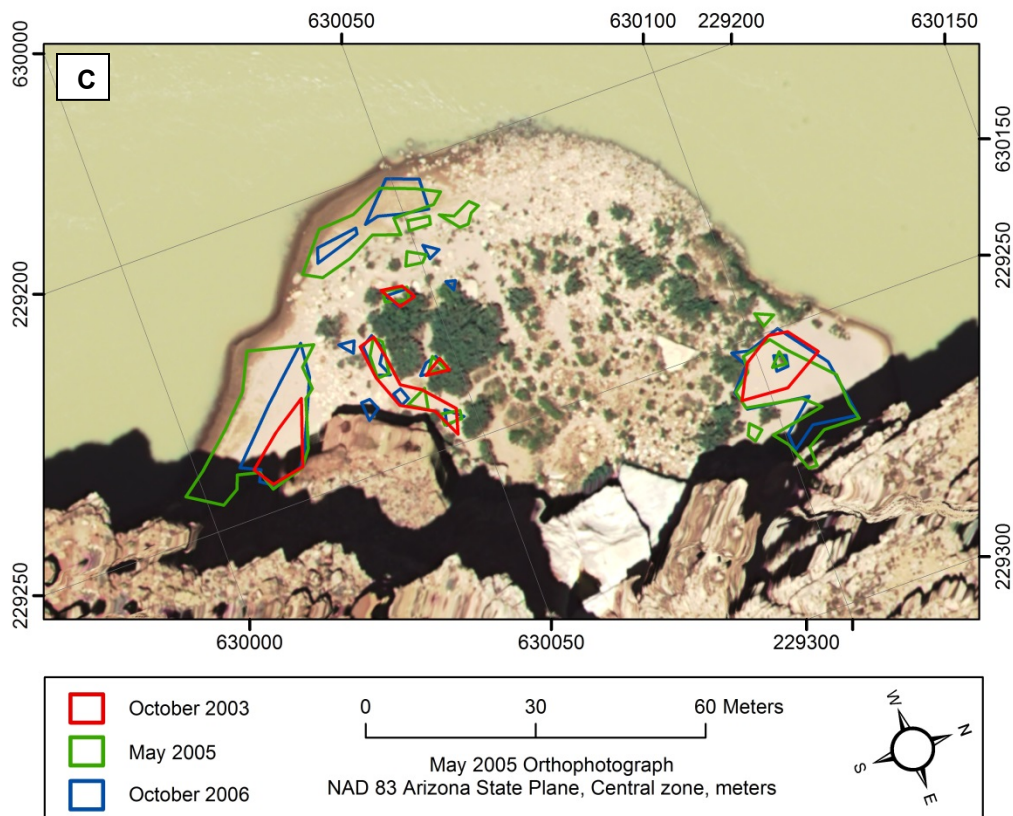


Figure A6. Time series plot showing campsite area at Hot Na Na camp (River Mile 16.6L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A2 for data.





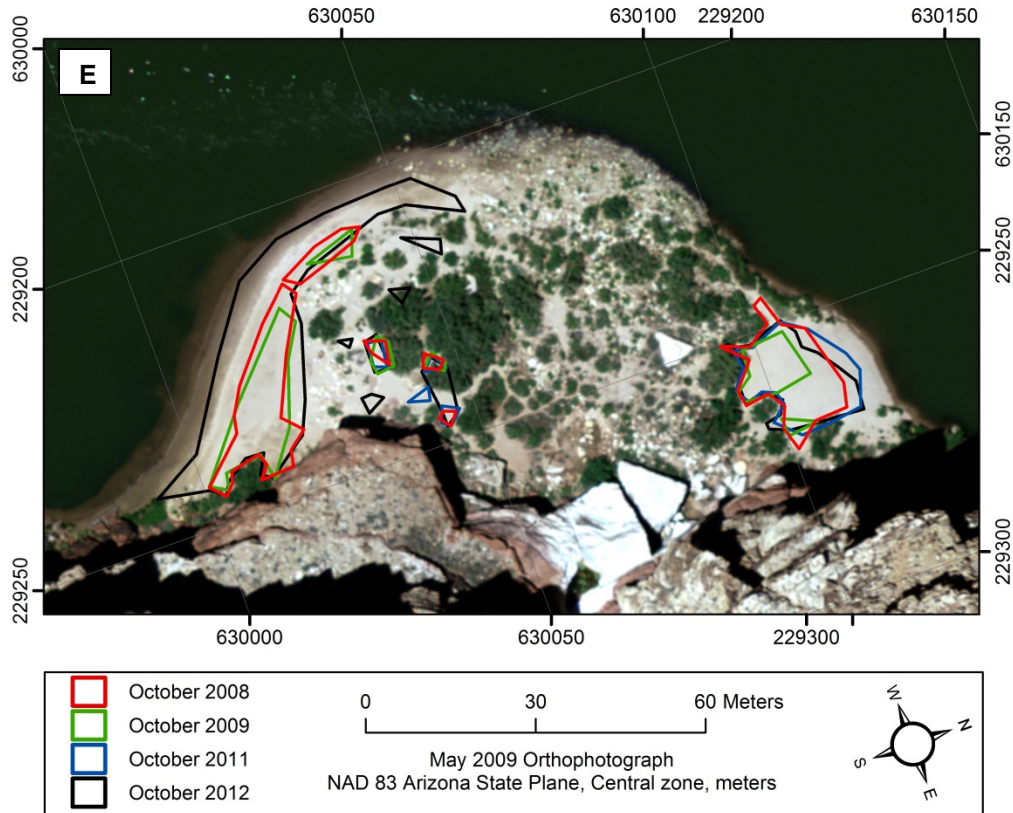


Figure A7. Maps showing campsite areas measured at Hot Na Na camp (River Mile 16.6L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A8. Remote-camera photographs showing Hot Na Na camp located at River Mile 16.6L. Flow in main channel is from left to right. (A) Photograph taken on October 15, 1998; (B) photograph taken on October 4, 2012.

Campsite Name: 22 Mile

River Mile: 22.1, River Right

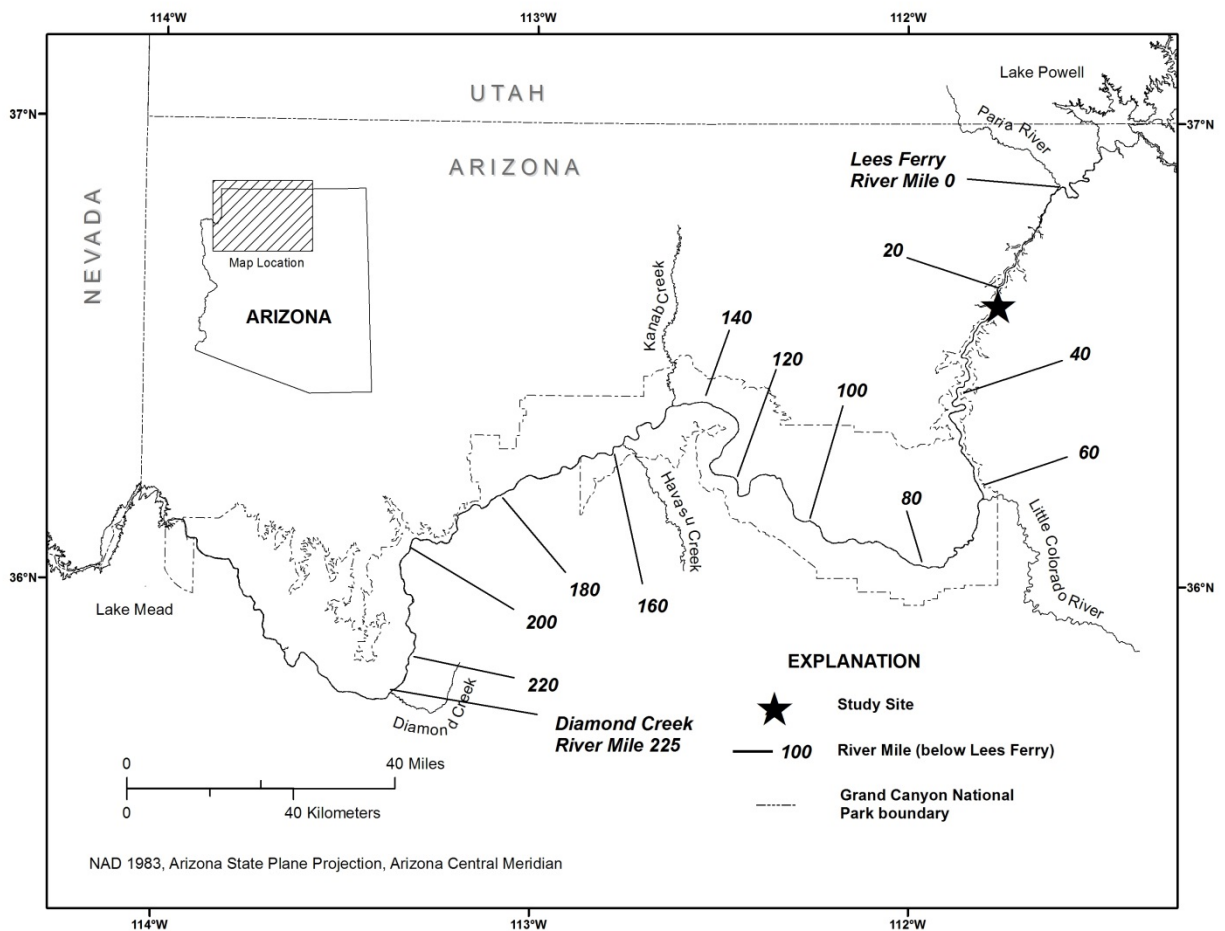


Figure A9. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 22 Mile camp study site (River Mile 22.1R).

Table A3. Campsite area in different stage-elevation zones at 22 Mile camp (River Mile 21.1L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998	142	668	52	10	47	9	720	66	786
10/4/1999		111	426	4	24	15	537	43	580
10/16/2000	80	65	154	152	0	0	219	152	371
10/6/2001	386	41	93	147	0	0	134	147	280
9/21/2002	315	0	34	106	0	0	34	106	140
4/26/2003	166	171	45	82	0	0	216	82	298
9/21/2003	470	43	21	74	0	0	64	74	138
5/8/2005	130	442	12	135	247	0	454	382	836
10/8/2006	342	19	0	6	173	0	19	179	198
10/14/2007	320	466	0	9	39	0	466	48	514
2/3/2008	786	255	0	8	122	0	255	130	385
3/29/2008	347	48	100	0	373	0	148	373	521
10/12/2008	220	47	55	0	259	0	102	259	361
10/11/2009	461	0	5	17	183	0	5	200	204
10/6/2011		0	286	0	42	19	286	61	347
10/4/2012	501	63	17	0	23	23	80	46	127

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

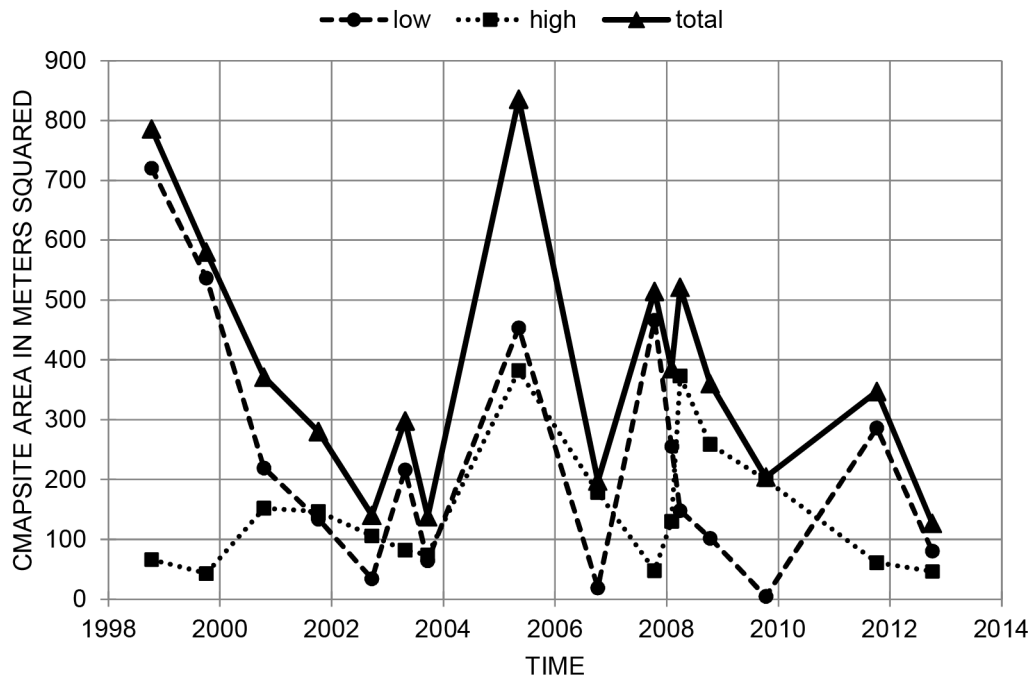
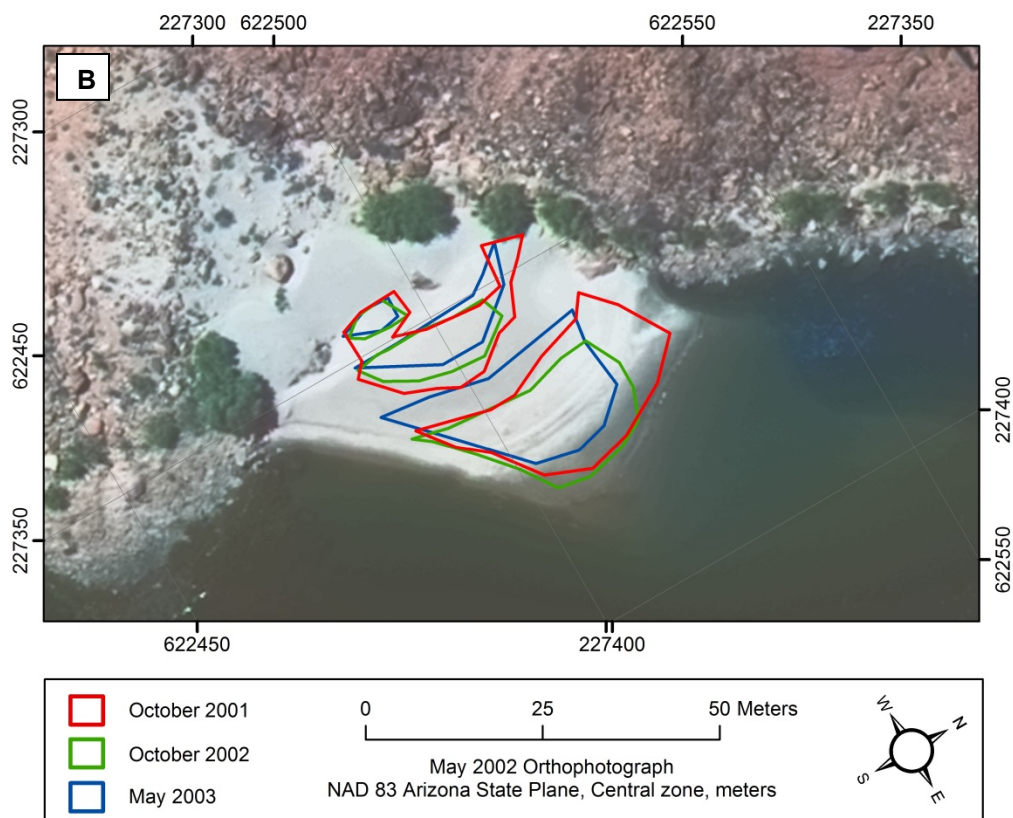
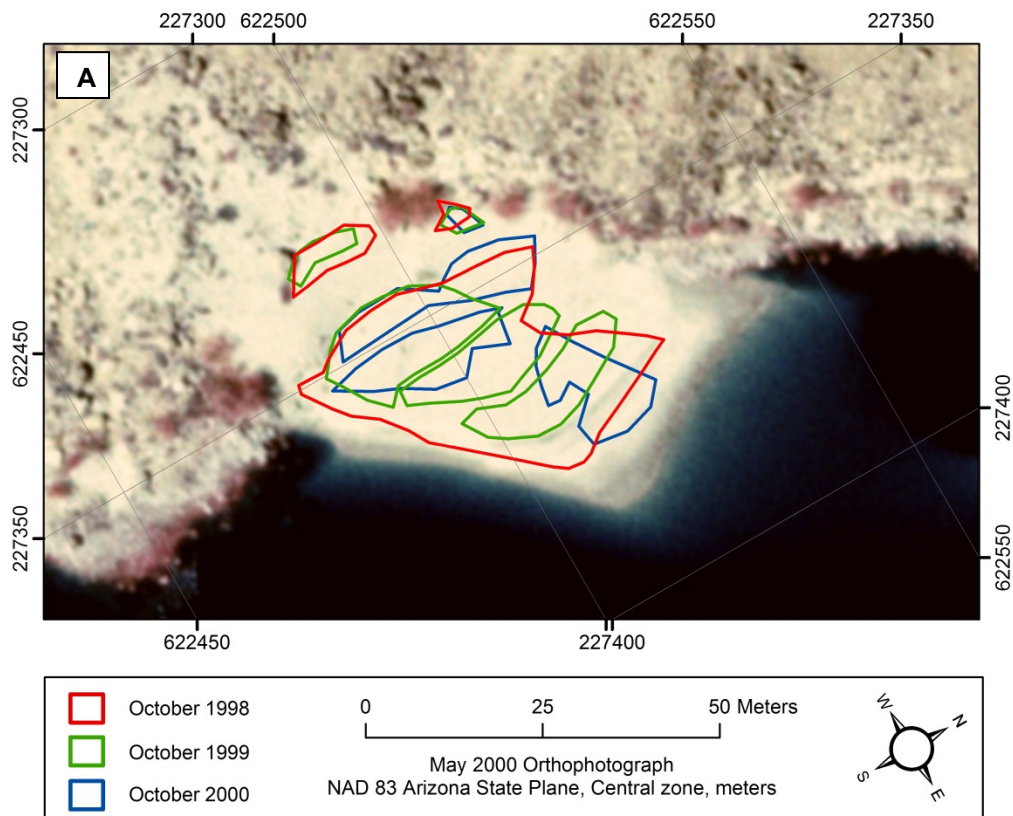
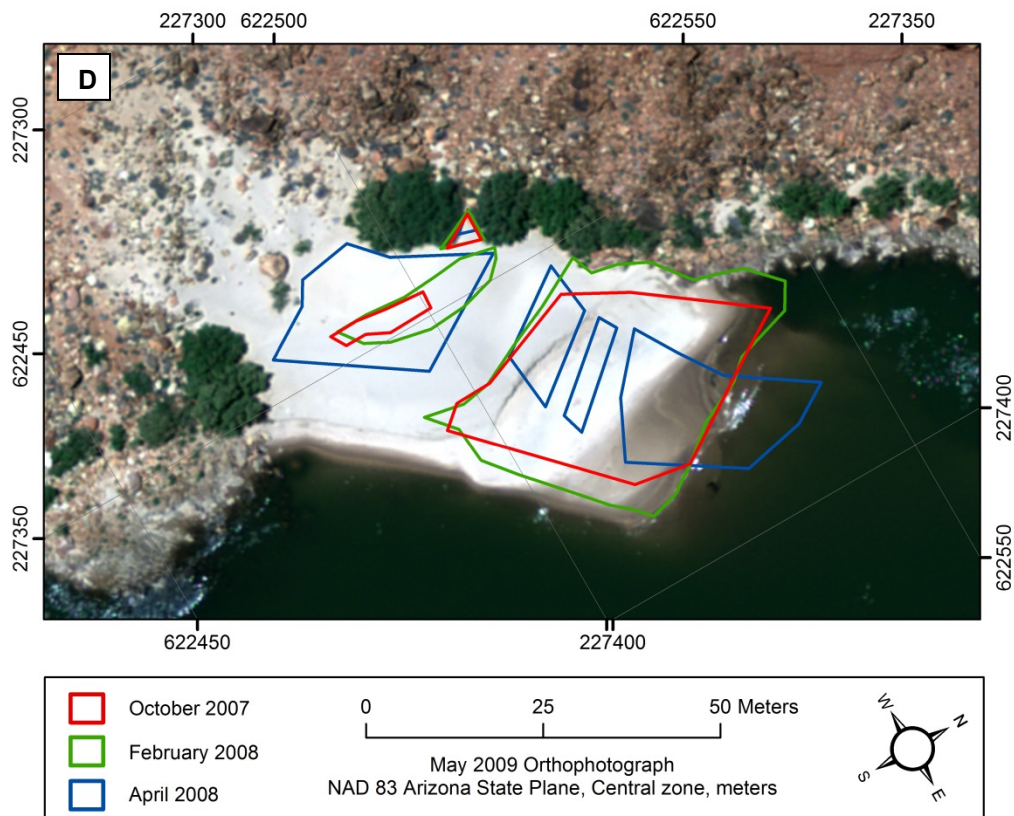
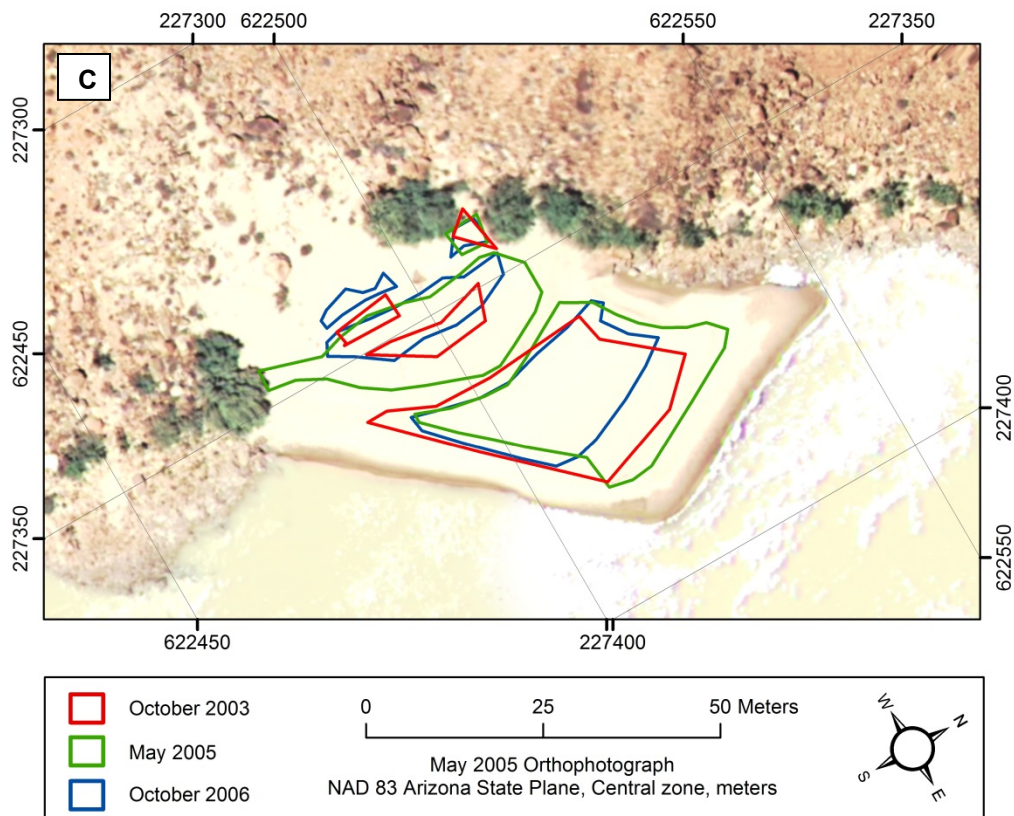


Figure A10. Time series plot showing campsite area at 22 Mile camp (River Mile 22.1R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A3 for data.





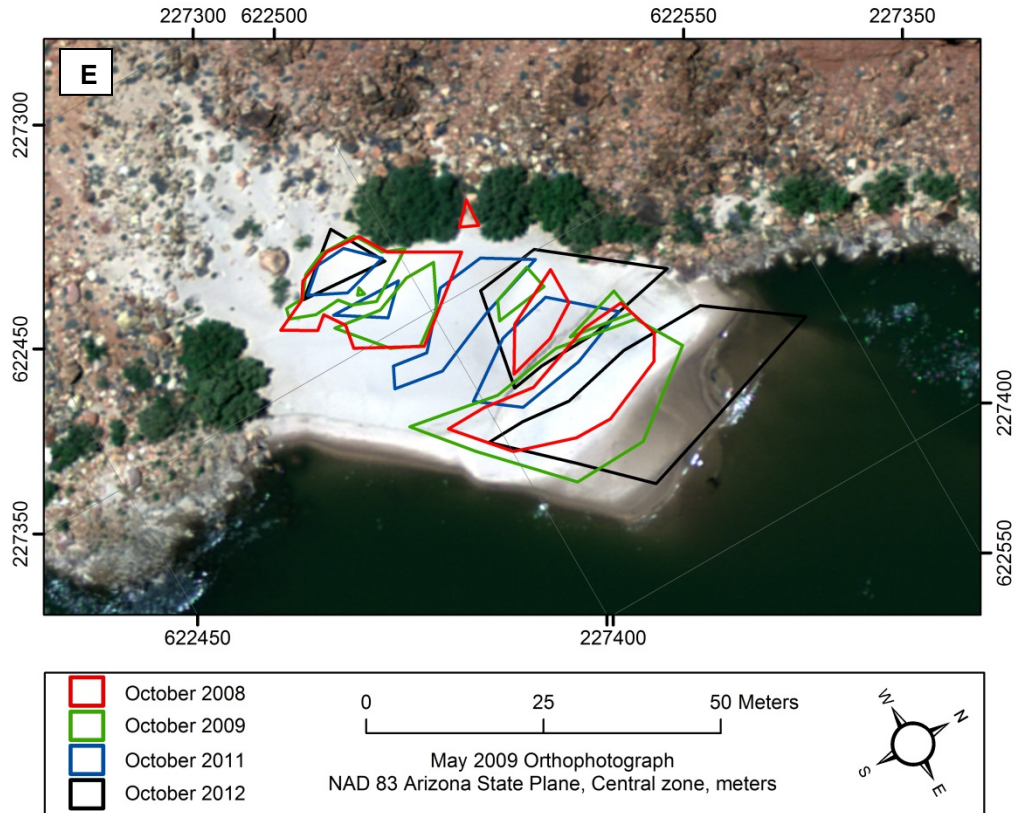


Figure A11. Maps showing campsite areas measured at 22 Mile camp (River Mile 22.1R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A12. Remote-camera photographs showing 22 Mile camp located at River Mile 22.1R. Flow in main channel is from right to left. (A) Photograph taken on October 15, 1998; (B) photograph taken on October 4, 2012.

Campsite Name: Lone Cedar

River Mile: 23.5, River Left

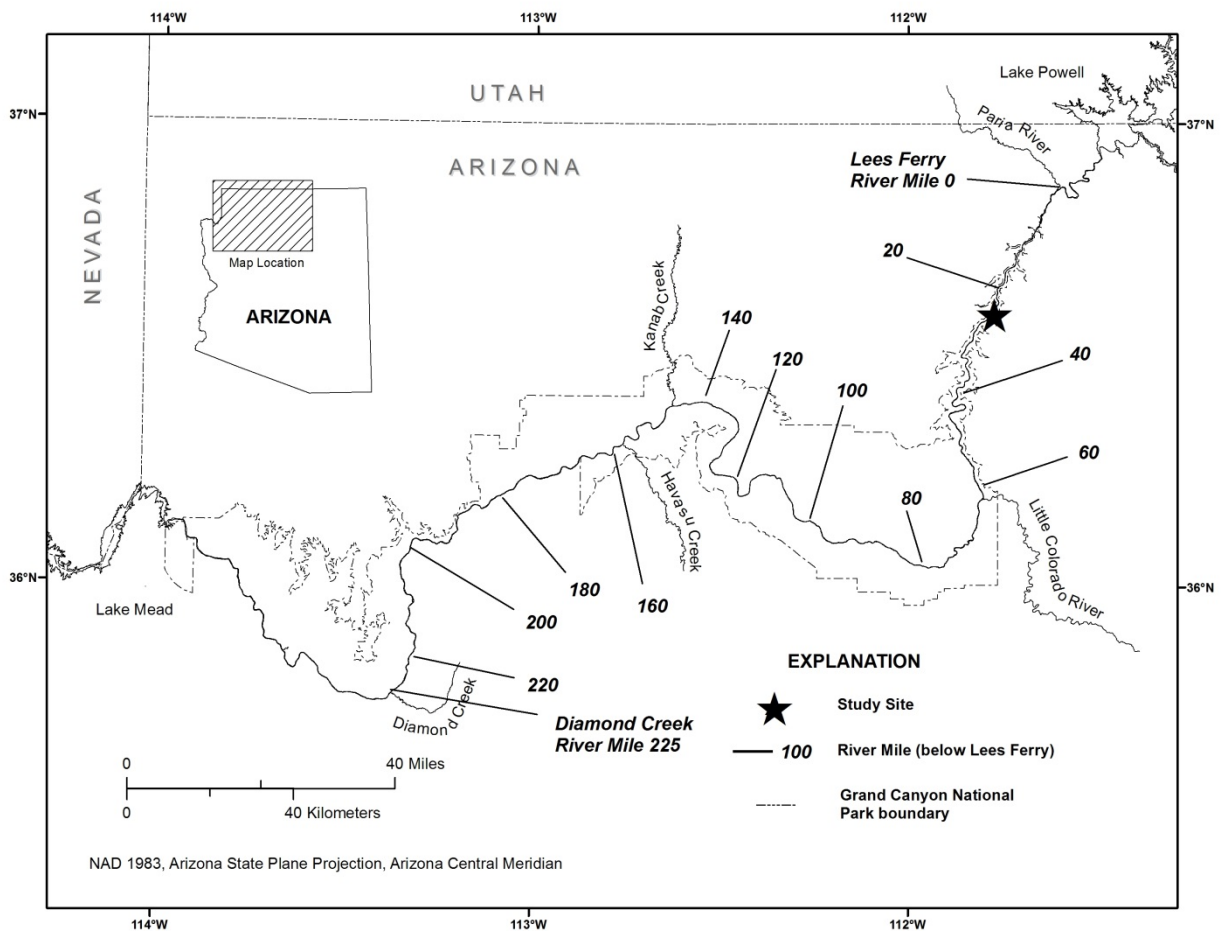


Figure A13. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Lone Cedar camp study site (River Mile 23.5L).

Table A4. Campsite area in different stage-elevation zones at Lone Cedar camp (River Mile 23.5L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
9/21/2002	0	119	506	6	3	0	624	9	633
4/26/2003	0	15	311	0	0	0	326	0	326
9/21/2003	0	120	363	5	0	0	482	5	488
5/8/2005	0	0	219	21	0	0	219	21	240
10/8/2006	0	14	129	8	0	0	143	8	151
10/14/2007	0	12	144	19	0	0	156	19	175
2/4/2008	0	14	149	13	0	0	164	13	177
3/29/2008	76	440	233	30	0	0	673	30	703
10/12/2008	59	439	212	35	0	0	651	35	686
10/11/2009	298	147	189	41	0	0	336	41	377
10/6/2011		370	120	19	1	0	489	19	508
10/4/2012	134	198	114	3	0	0	311	3	314

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

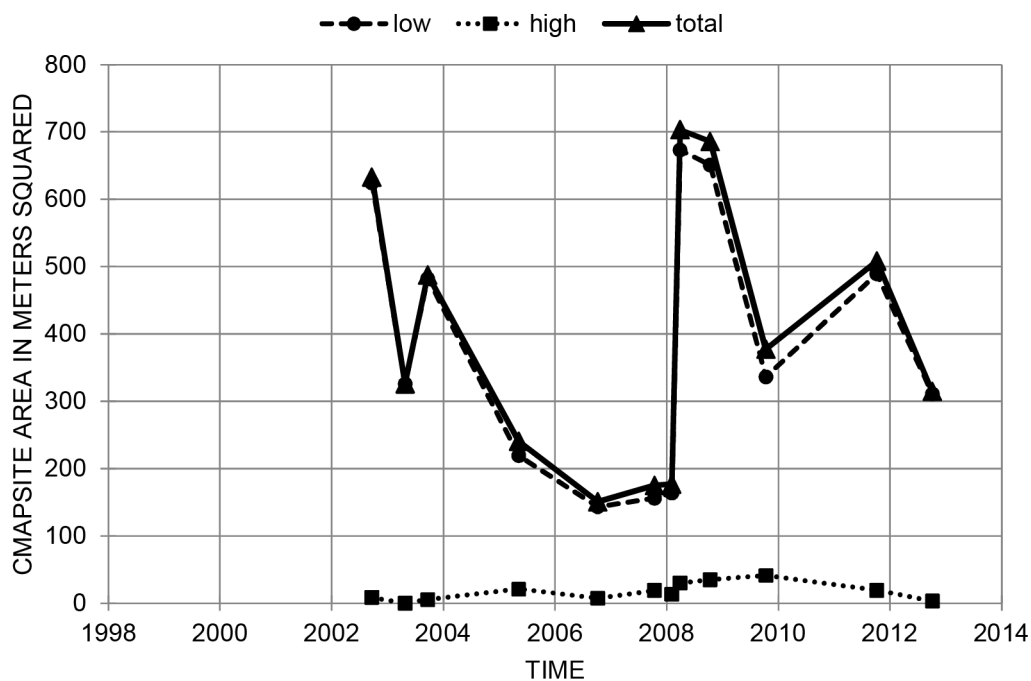
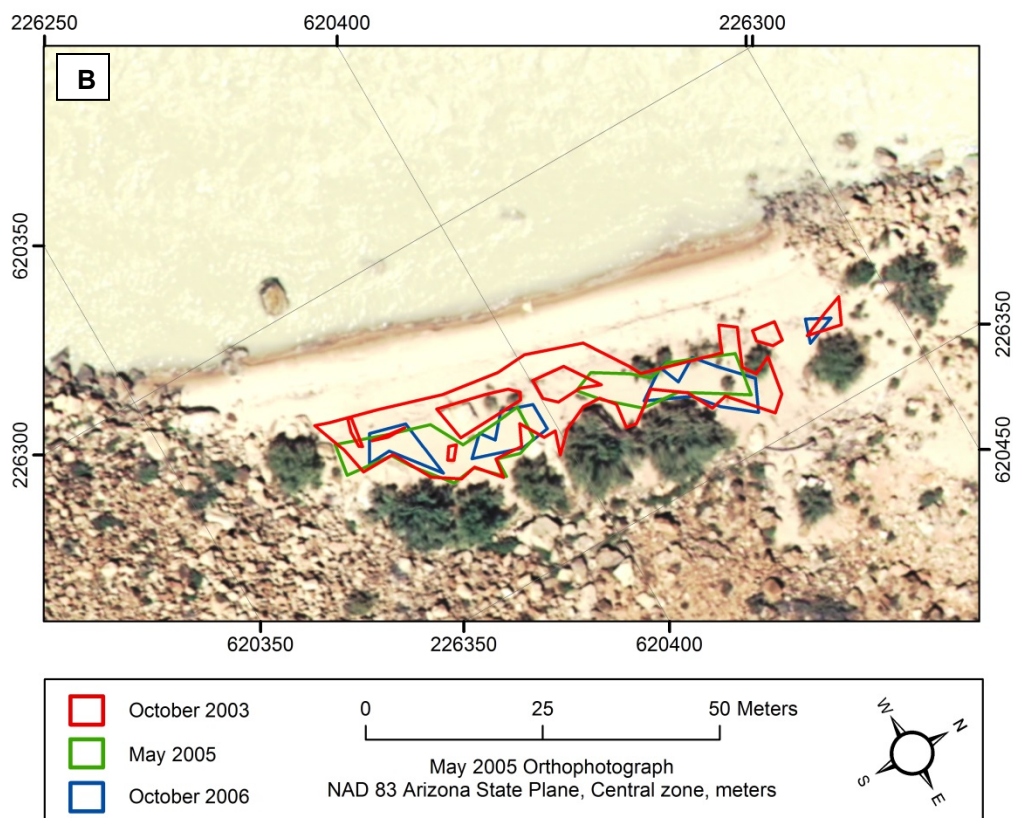
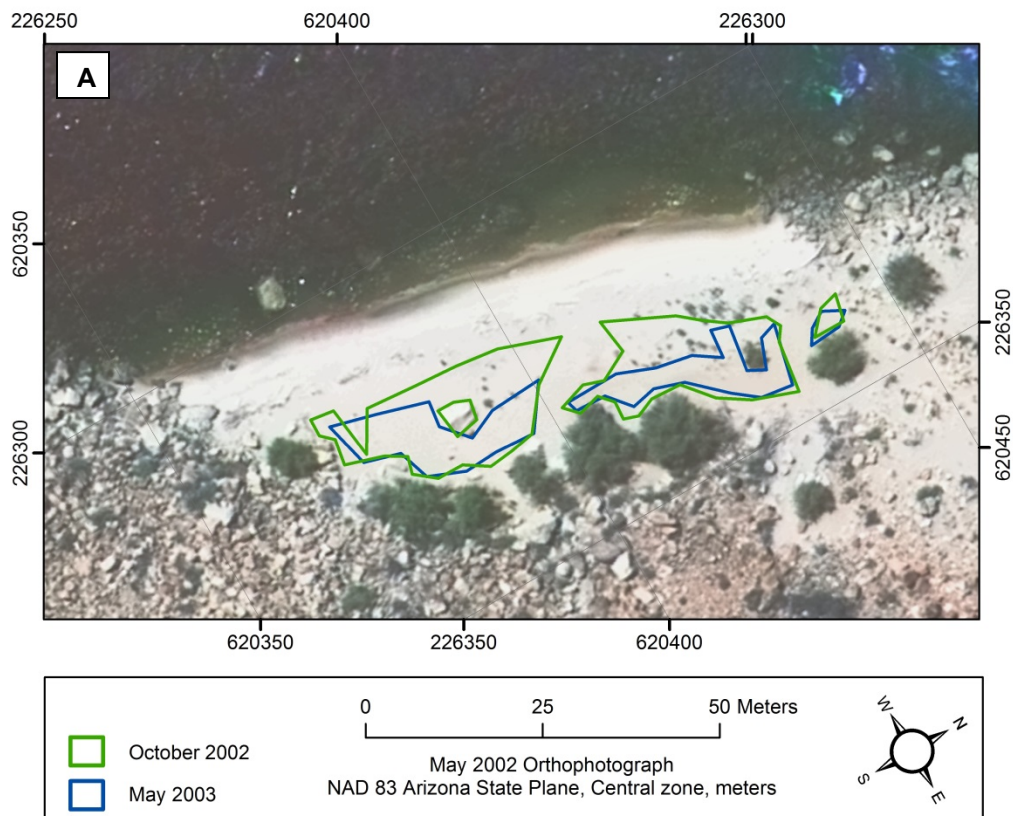


Figure A14. Time series plot showing campsite area at Lone Cedar camp (River Mile 23.5L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A4 for data.



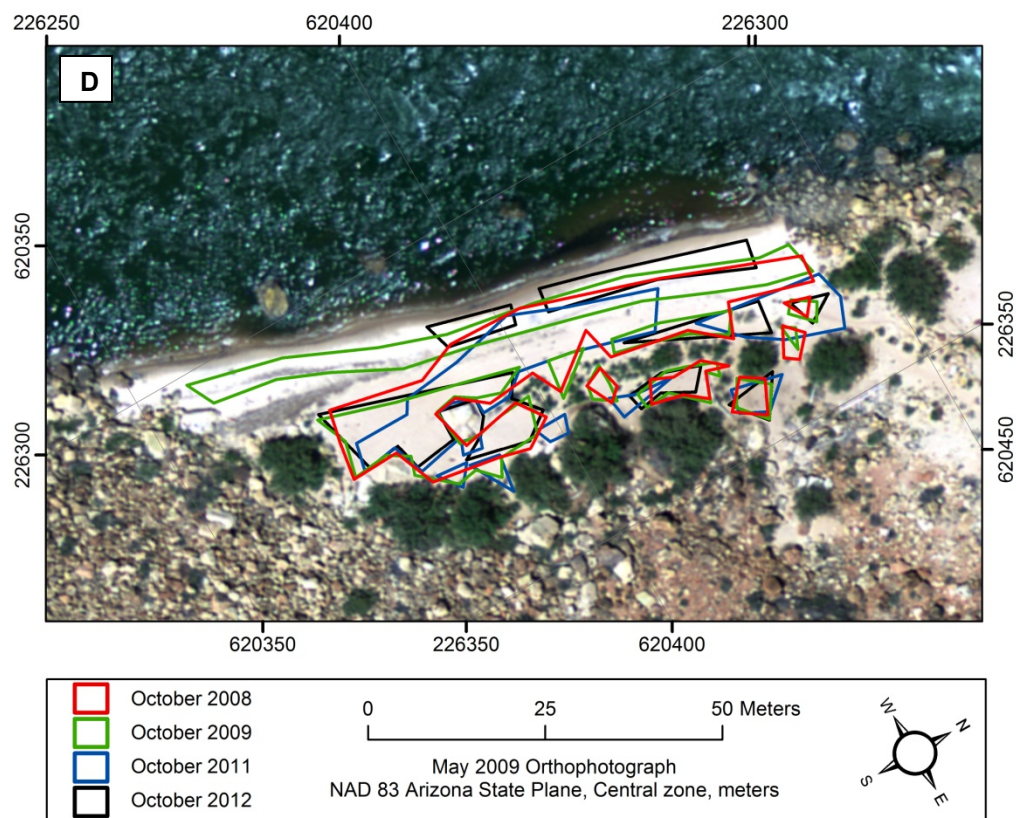
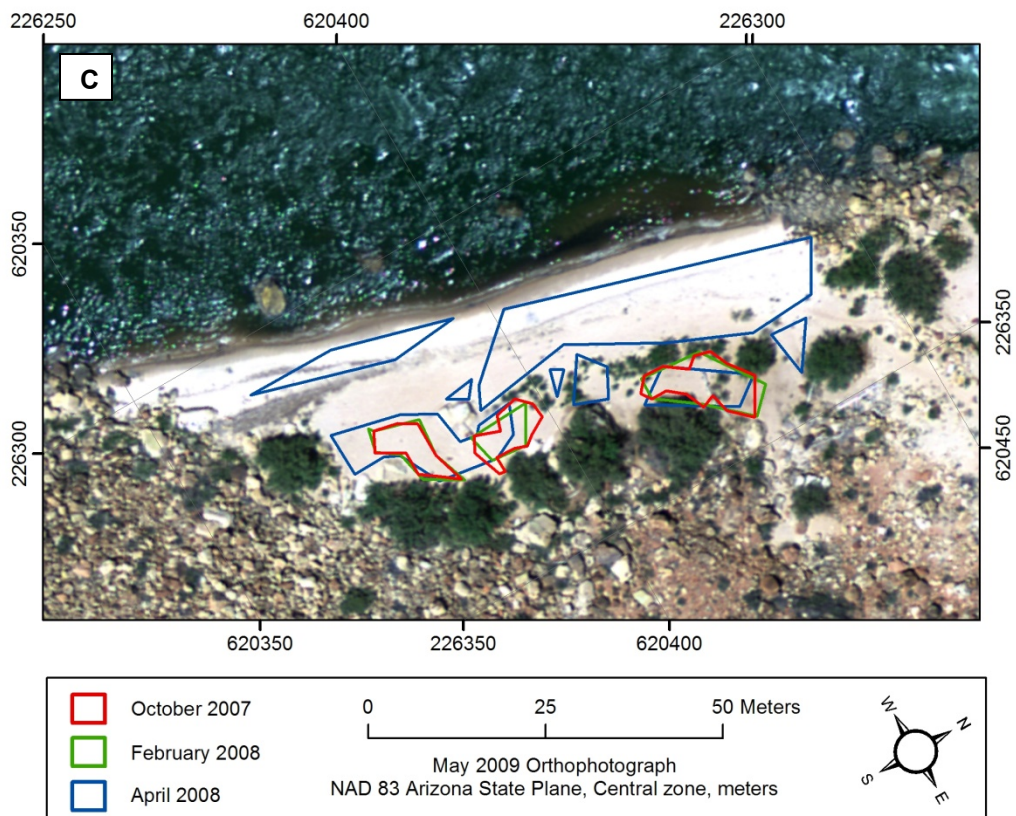


Figure A15. Maps showing campsite areas measured at Lone Cedar camp (River Mile 23.5L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A16. Remote-camera photograph showing Lone Cedar camp located at River Mile 23.5L. Flow in main channel is from left to right. Photograph taken on February 16, 2013.

Campsite Name: Silver Grotto

River Mile: 29.5, River Left

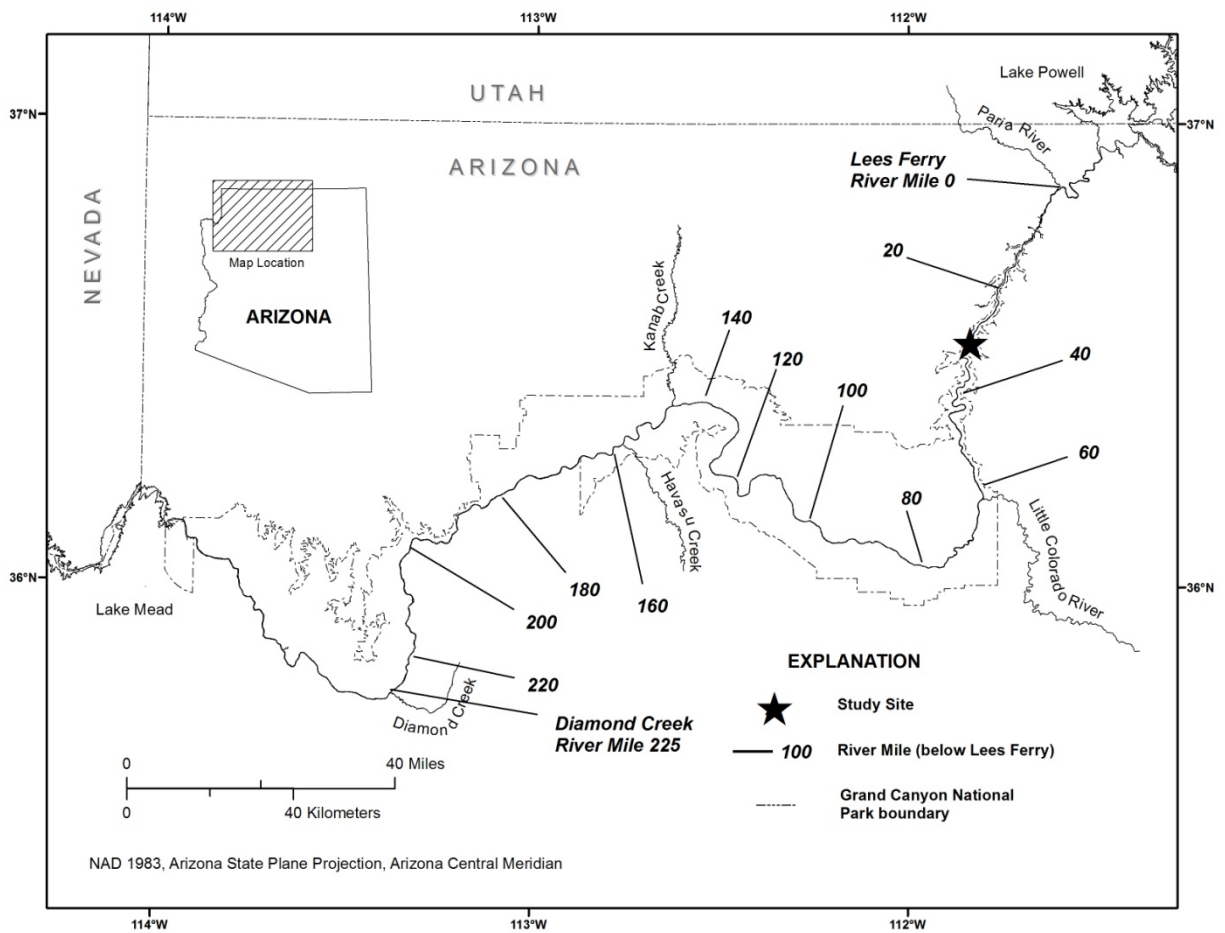


Figure A17. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park Map and the location of the Silver Grotto camp study site (River Mile 29.5L),.

Table A5. Campsite area in different stage-elevation zones at Silver Grotto camp (River Mile 29.5L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
9/22/2002	198	83	150	53	129	0	232	182	414
4/27/2003	261	141	159	76	145	0	300	221	521
9/21/2003	266	60	100	59	118	0	160	177	337
5/9/2005	174	227	418	44	131	0	645	175	820
10/9/2006	49	54	149	16	137	0	202	153	355
10/15/2007	82	21	67	24	120	0	88	144	232
2/4/2008	0	38	64	28	68	0	102	96	198
3/30/2008	58	163	363	141	148	0	526	289	815
9/22/2008	148	92	483	61	143	0	575	204	779
10/12/2009	188	2	304	6	184	0	305	189	495
10/7/2011		117	1	12	180	0	117	192	309
10/5/2012	107	341	1	9	162	0	342	171	512

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

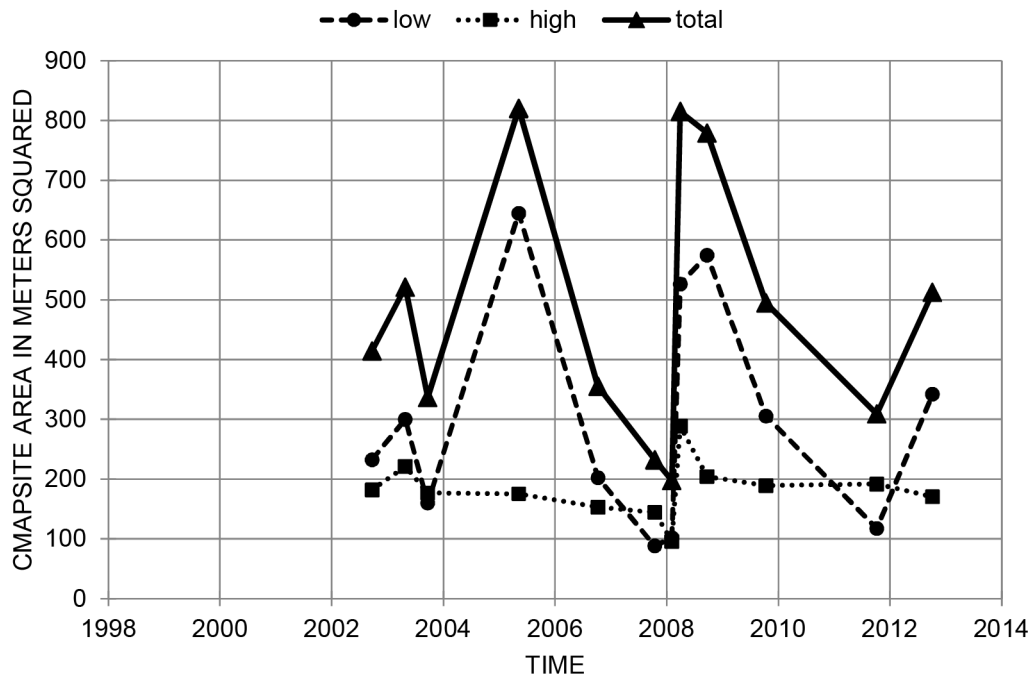
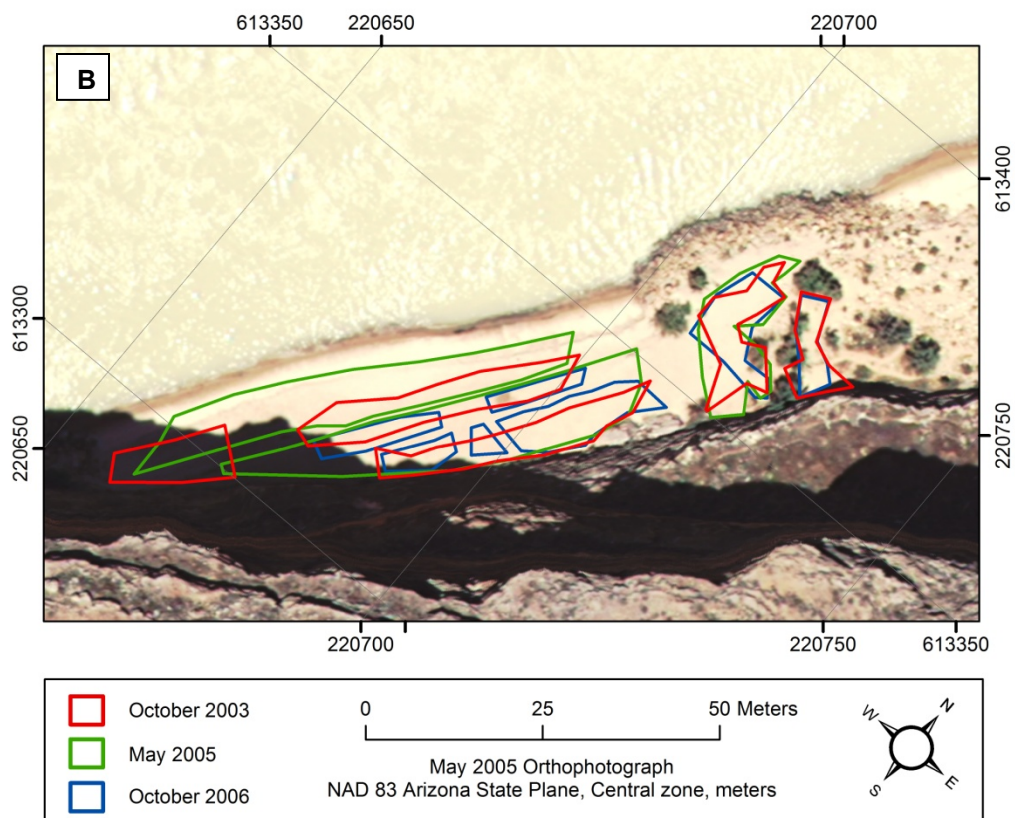
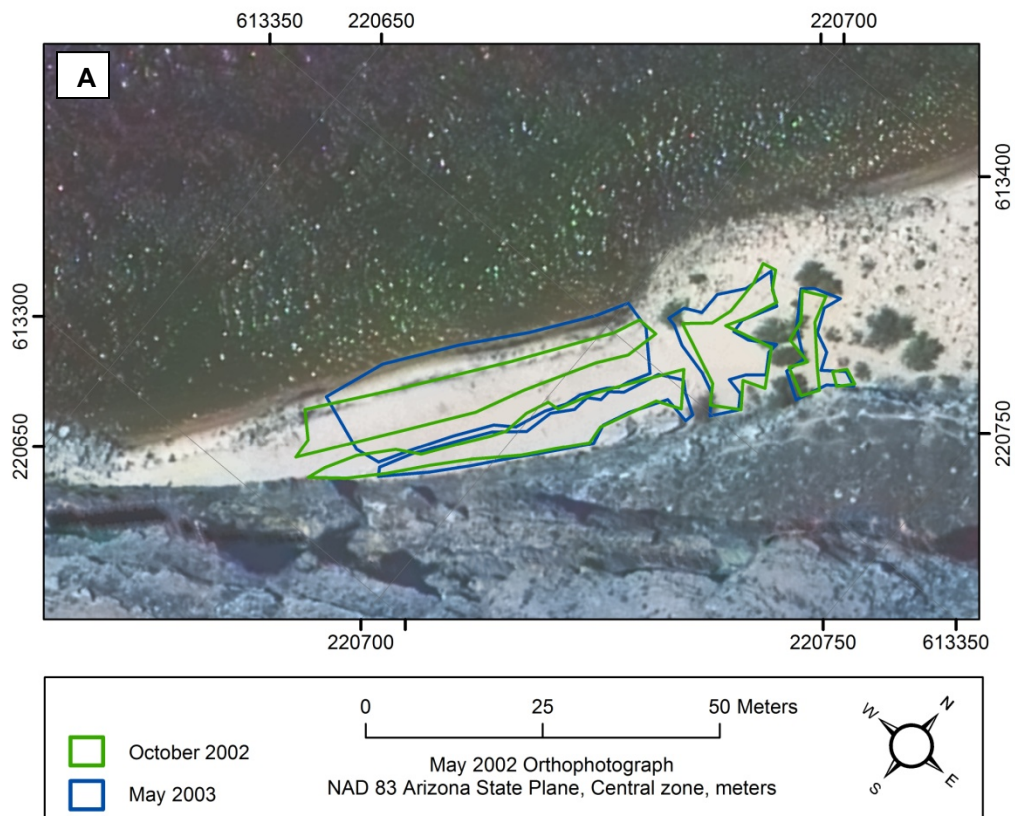


Figure A18. Time series plot showing campsite area at Silver Grotto camp (River Mile 29.5L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A5 for data.



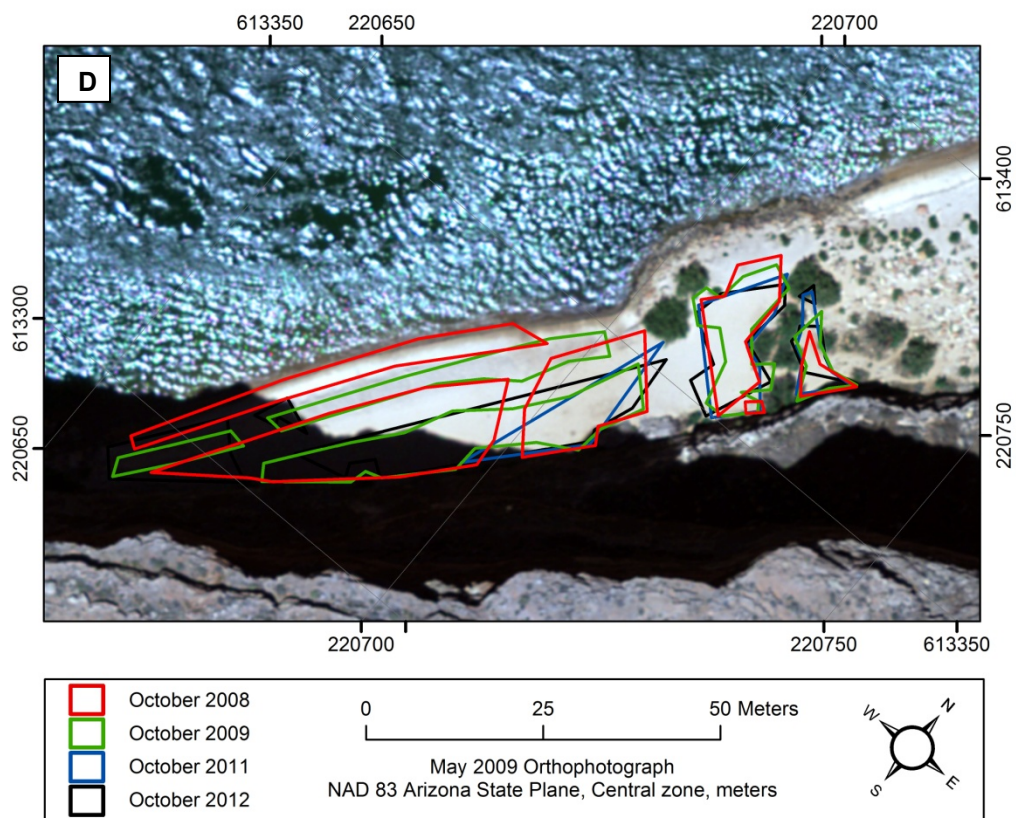
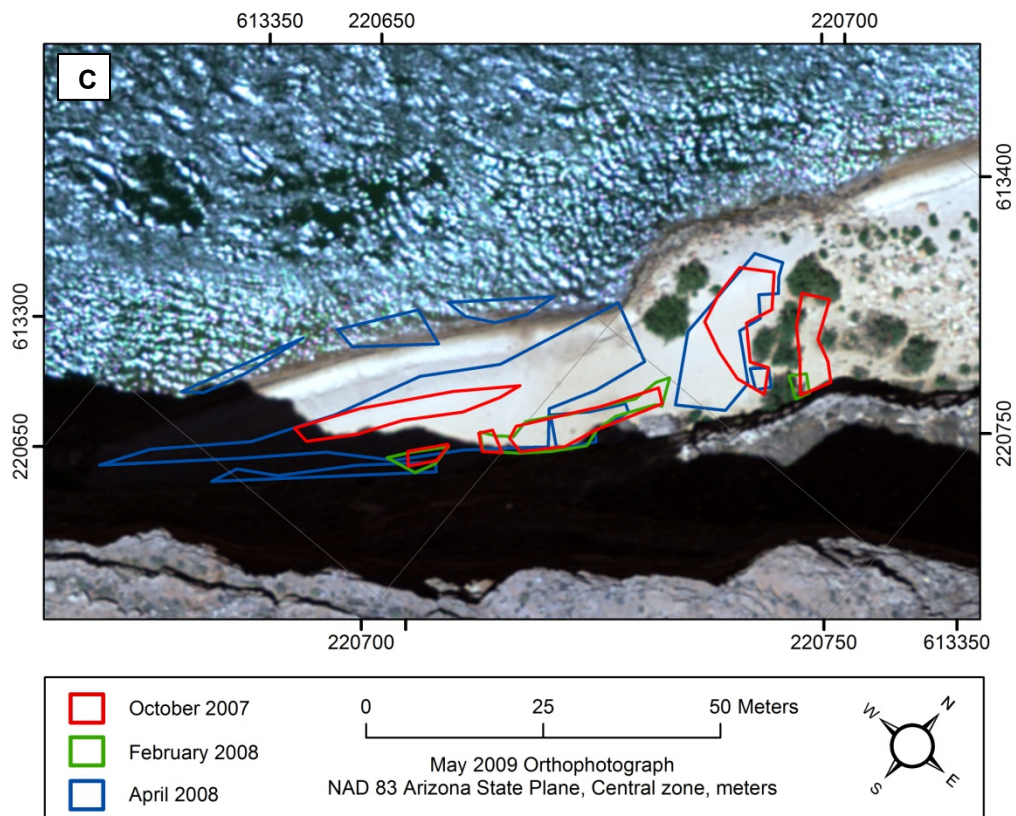


Figure A19. Maps showing campsite areas measured at Silver Grotto camp (River Mile 29.5L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively; (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively; (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively; (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.

Campsite Name: Sand Pile

River Mile: 30.7, River Right

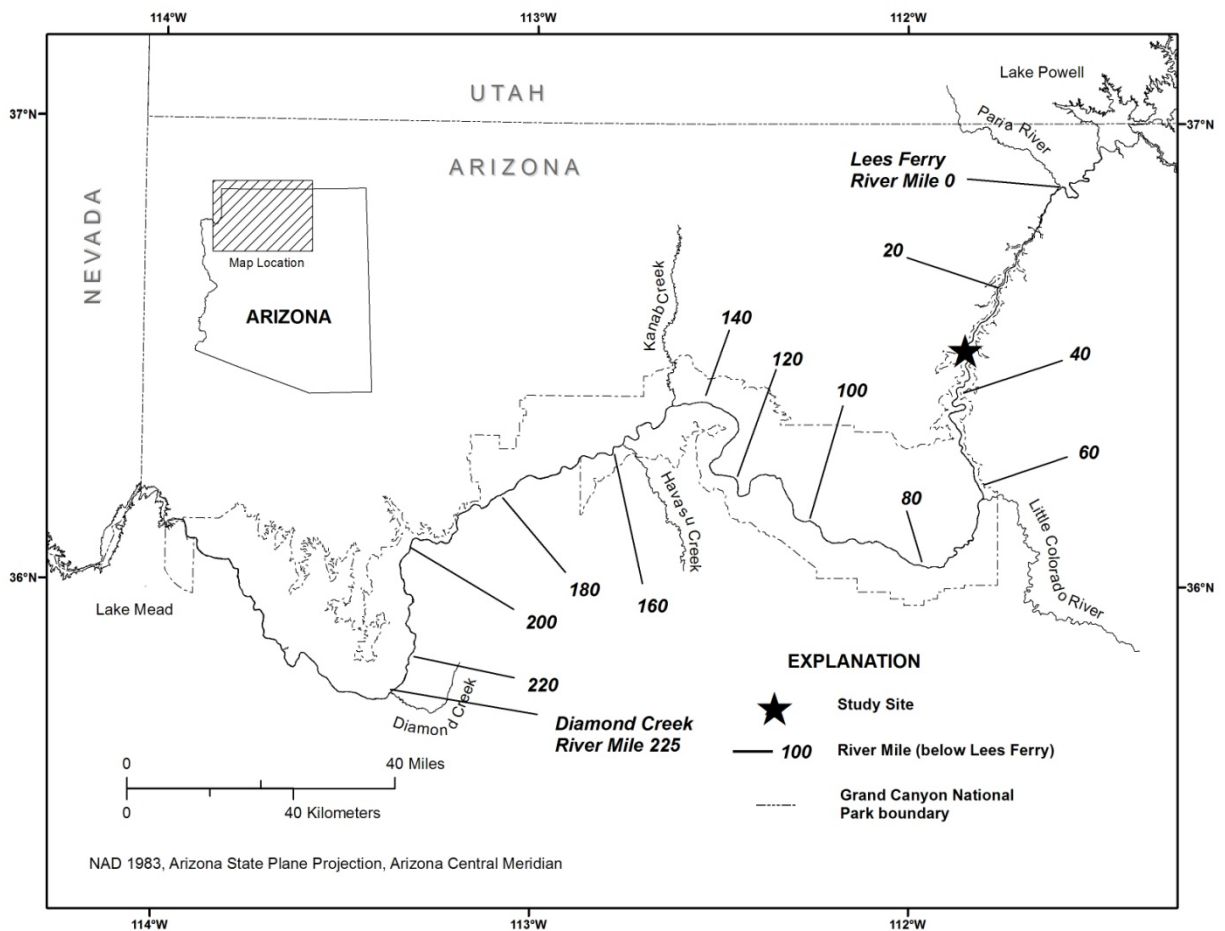


Figure A20. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Sand Pile camp study site (River Mile 30.7R).

Table A6. Campsite area in different stage-elevation zones at Sandpile camp (River Mile 30.7R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/11/1998		0	443	0	153	144	443	296	739
10/5/1999		113	83	6	301	45	196	353	549
10/16/2000	254	162	321	79	75	23	482	178	660
10/6/2001	890	341	79	44	51	22	420	117	537
9/21/2002	501	437	42	0	24	11	479	35	514
4/27/2003	317	512	0	0	65	15	512	80	592
9/22/2003	585	880	0	0	22	6	880	28	908
5/9/2005	83	536	39	15	547	5	574	566	1141
10/9/2006	0	0	26	4	264	4	26	272	298
10/15/2007	0	0	0	0	171	14	0	185	185
2/4/2008	76	0	59	50	143	7	59	201	260
3/30/2008	180	201	201	49	468	30	402	547	948
10/13/2008	121	131	2	0	267	0	133	267	400
10/12/2009	424	14	0	0	85	0	14	85	99
10/7/2011		0	1146	0	0	0	1146	0	1146
10/5/2012	786	173	449	0	0	0	622	0	622

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

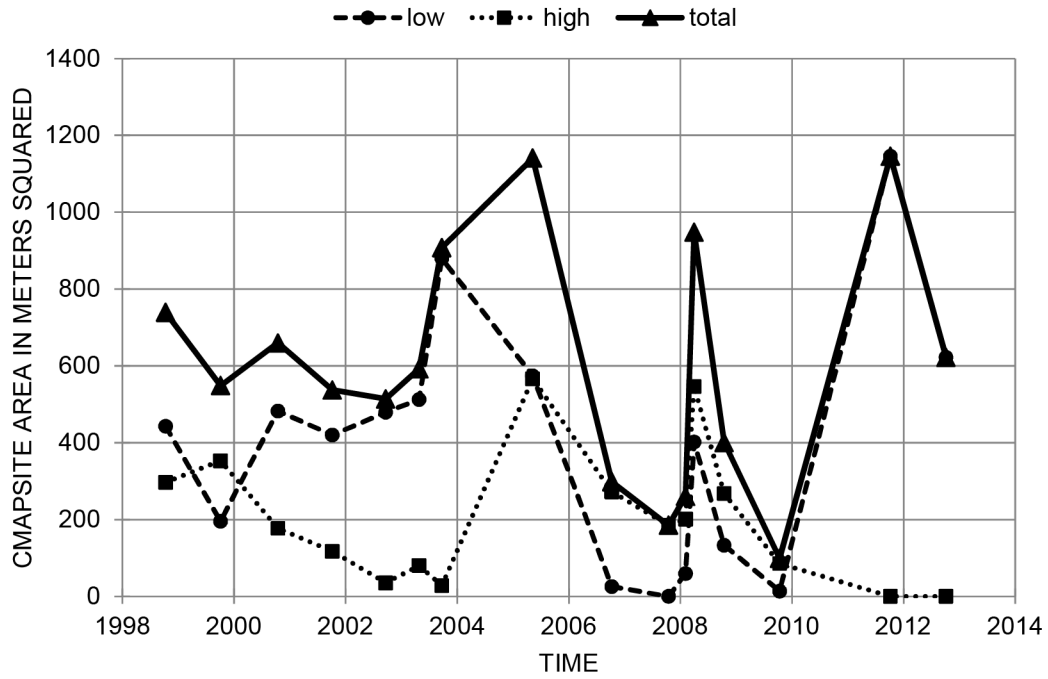
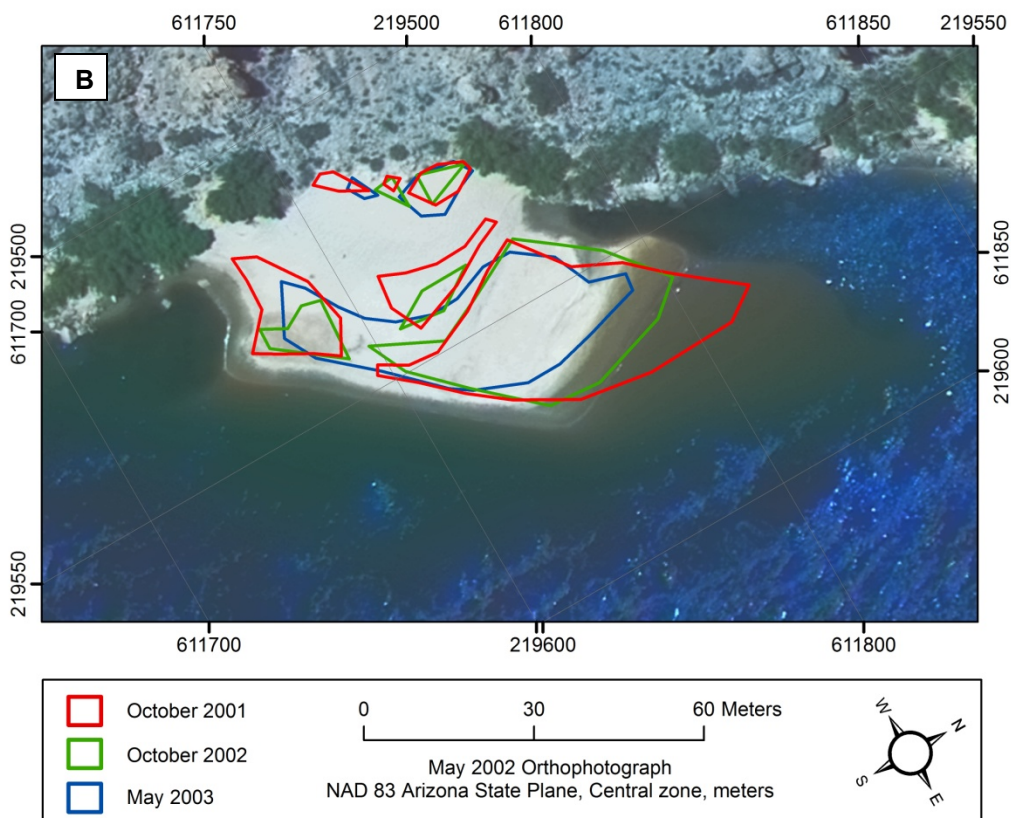
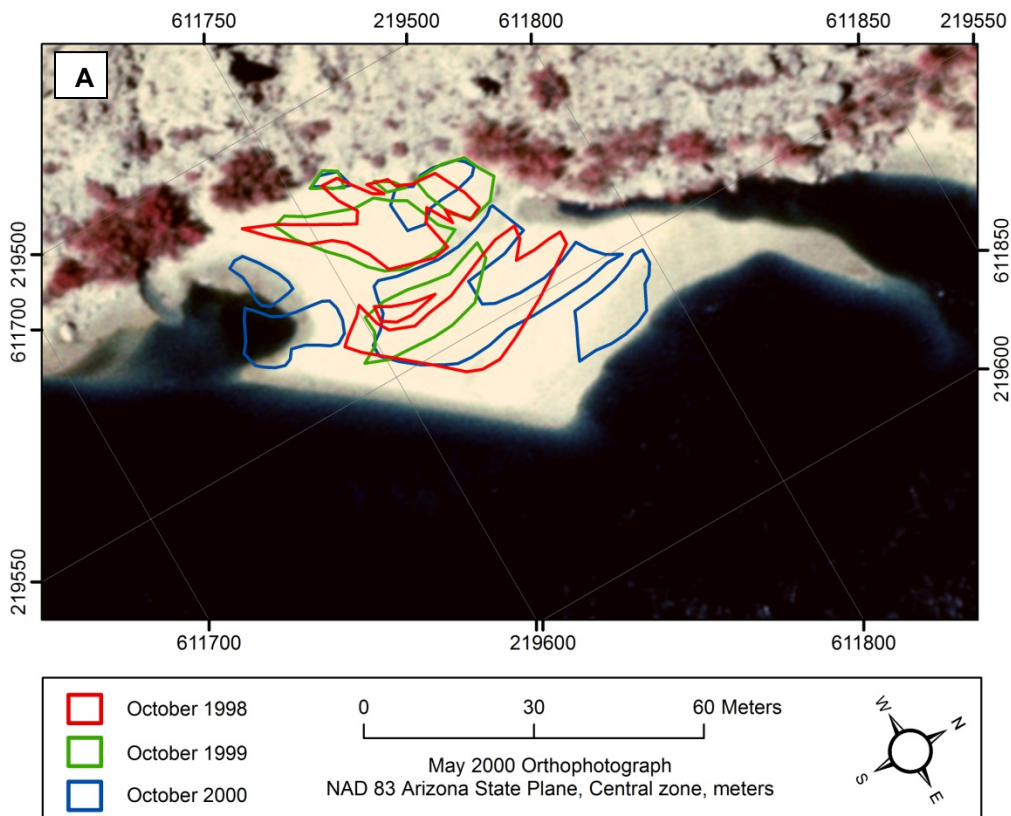
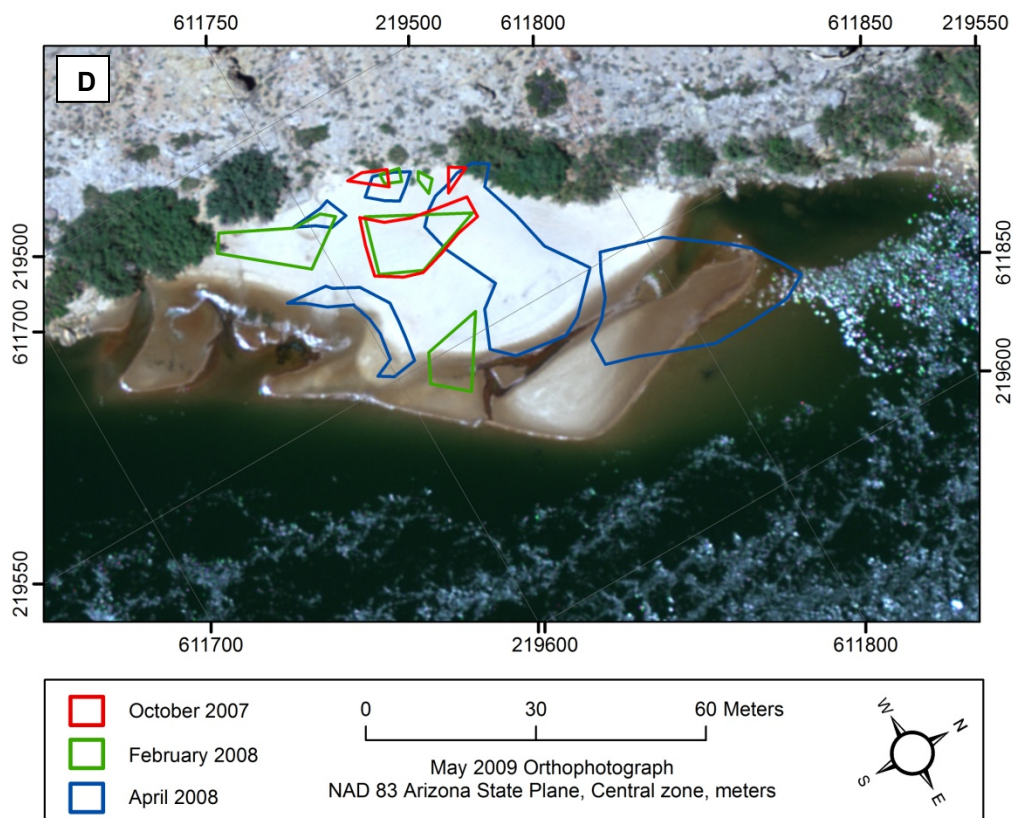
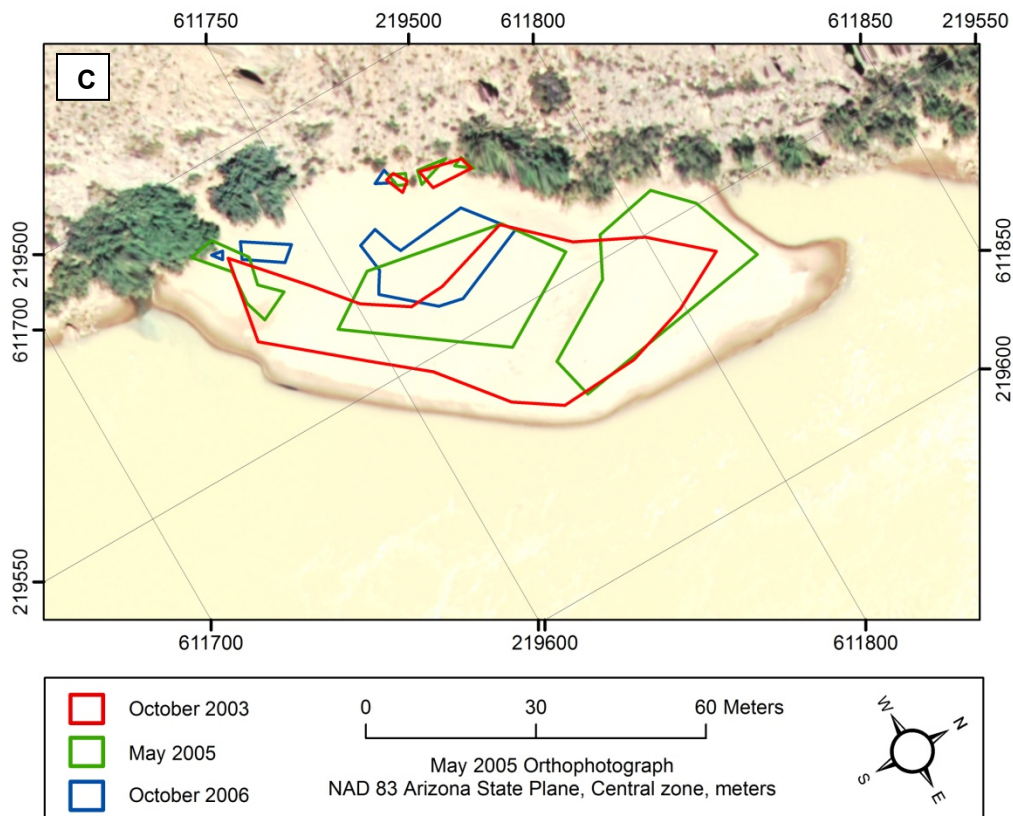


Figure A21. Time series plot showing campsite area at Sand Pile camp (River Mile 30.7L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A6 for data.





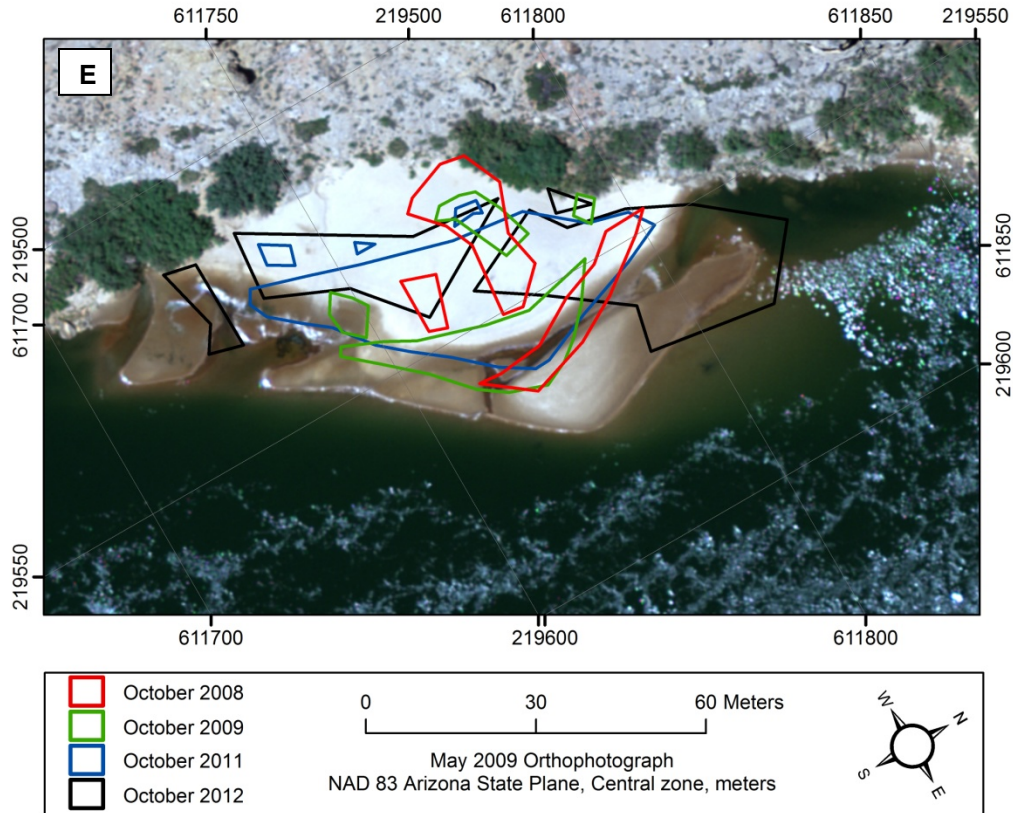


Figure A22. Maps showing campsite areas measured at Sand Pile camp (River Mile 30.7R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively; (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively; (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively; (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively; (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A23. Remote camera photograph showing Sand Pile camp located at River Mile 30.7R. Flow in main channel is from right to left. Photograph taken on October 5, 2012.

Campsite Name: South Canyon

River Mile: 31.9, River Right

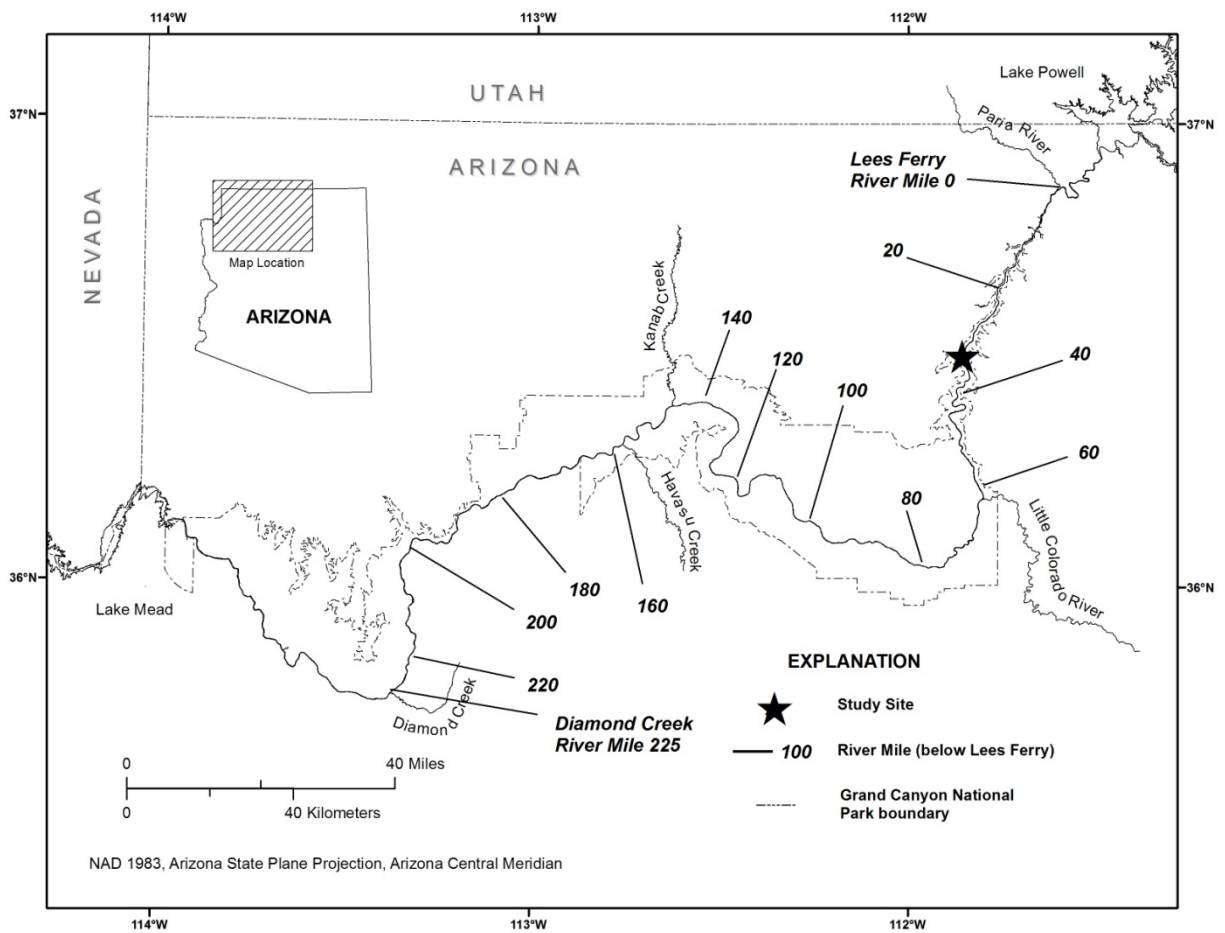


Figure A24. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Silver Grotto camp study site (River Mile 31.9R).

Table A7. Campsite area in different stage-elevation zones at South Canyon camp (River Mile 31.9R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	0	80	562	0	642	642
10/5/1999		0	0	0	88	587	0	675	675
10/16/2000	0	0	0	0	48	570	0	618	618
10/7/2001	0	0	0	0	53	519	0	572	572
9/22/2002	0	0	0	0	3	407	0	410	410
4/27/2003	0	0	0	0	5	423	0	428	428
9/22/2003	0	0	0	0	22	465	0	487	487
5/9/2005	0	0	0	12	45	370	0	428	428
10/9/2006	0	0	0	20	24	377	0	420	420
10/15/2007	0	0	0	0	17	267	0	284	284
2/5/2008	0	0	0	0	9	363	0	372	372
3/30/2008	0	0	0	2	91	325	0	418	418
10/13/2008	0	0	0	0	34	389	0	423	423
10/12/2009	0	0	3	8	28	404	3	440	443
10/7/2011	0	0	10	15	12	436	10	462	472
10/5/2012	0	0	0	10	2	388	0	400	400

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

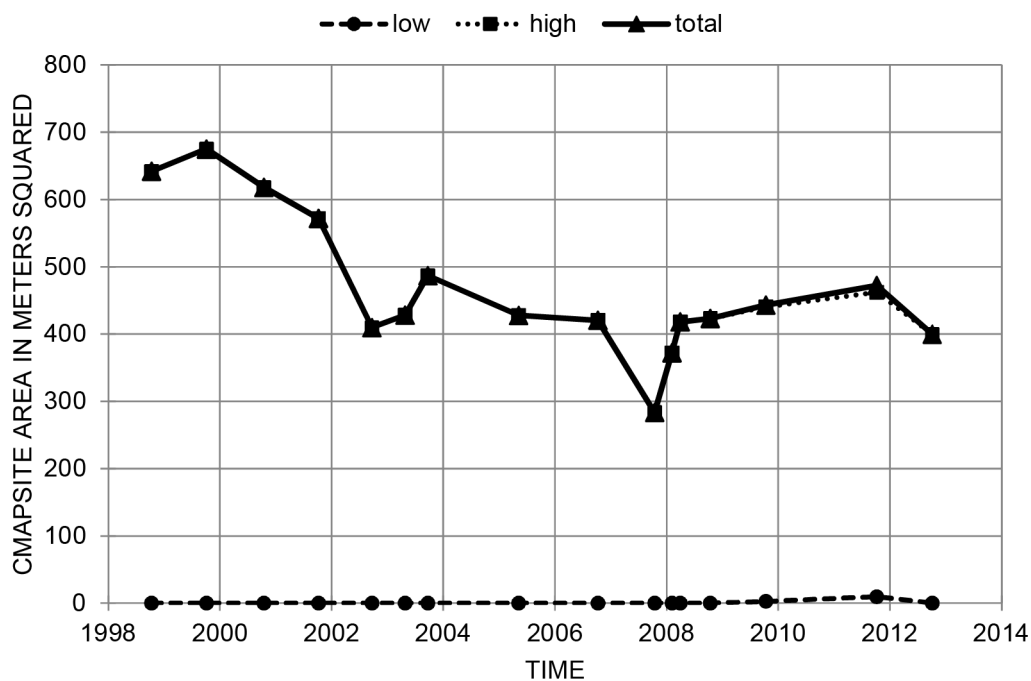
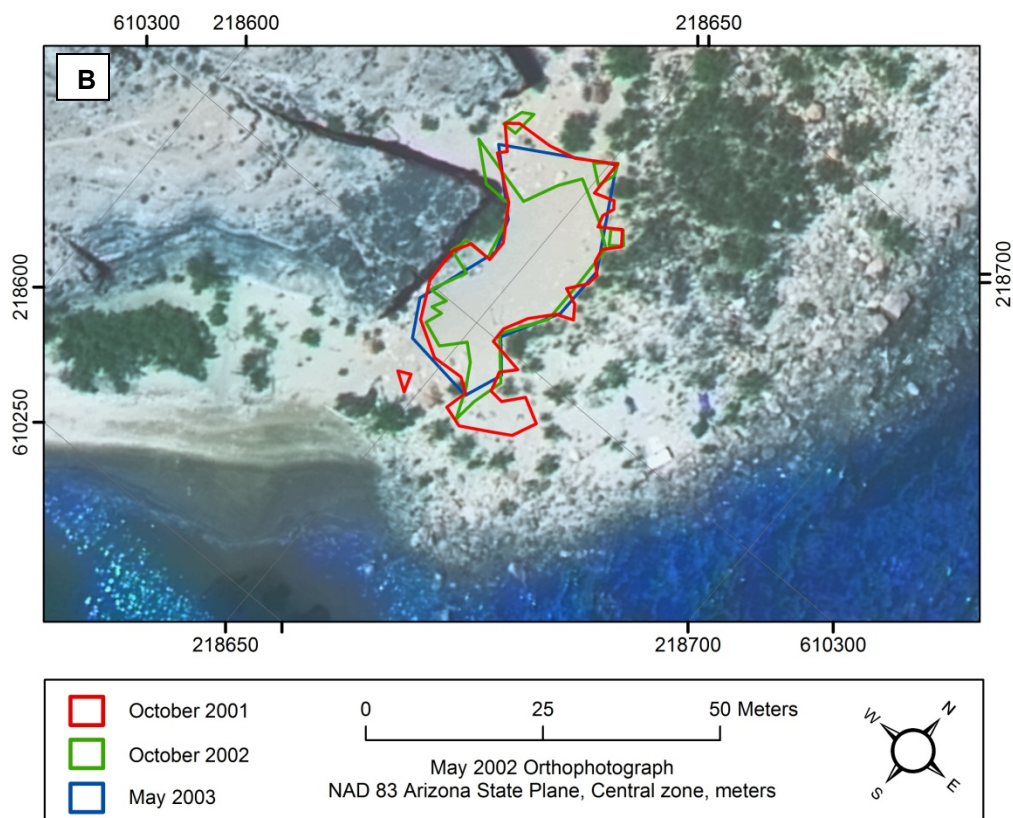
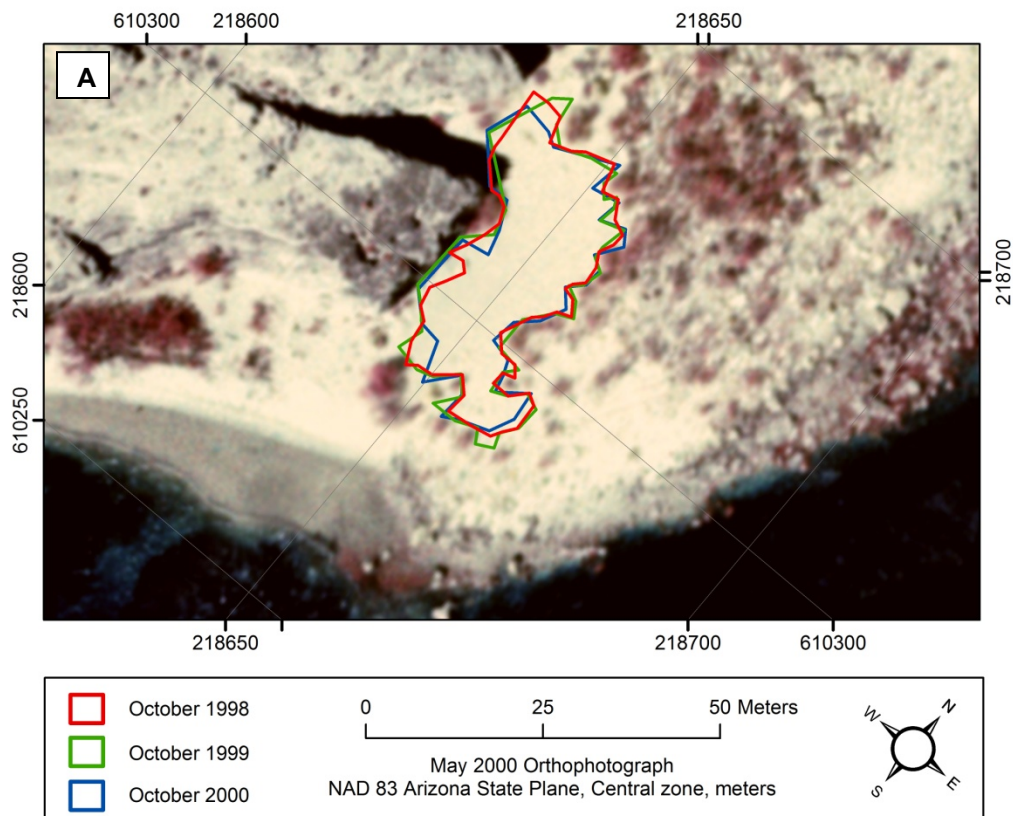
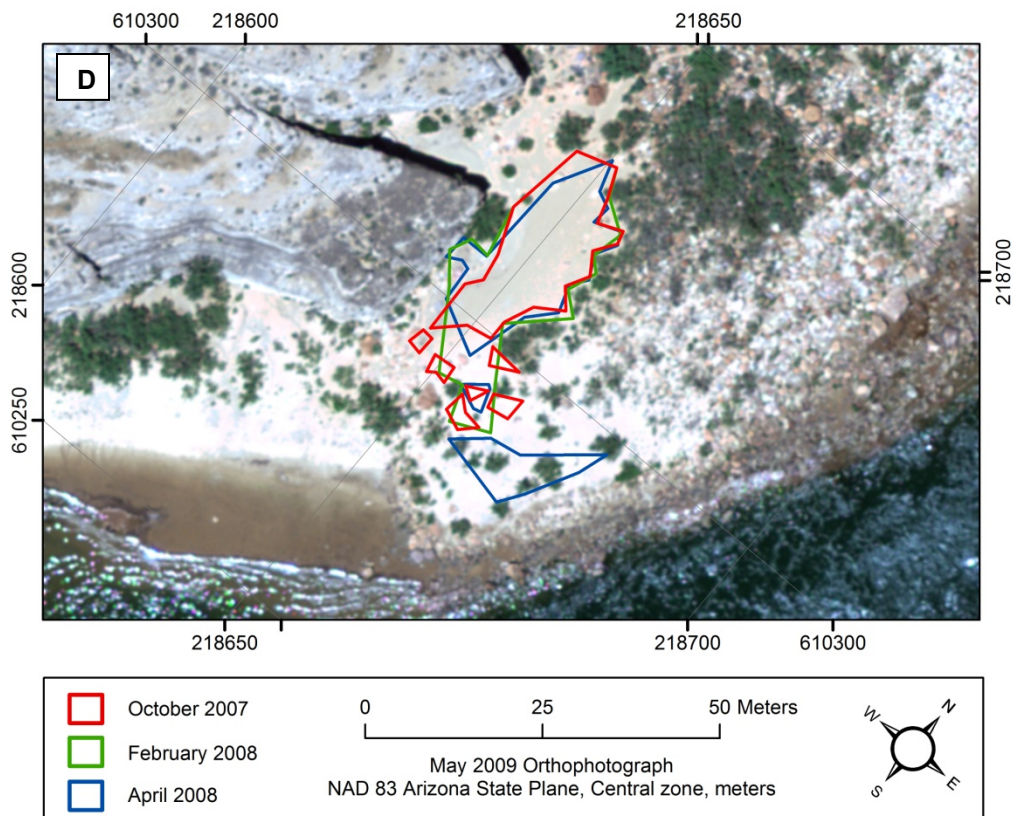
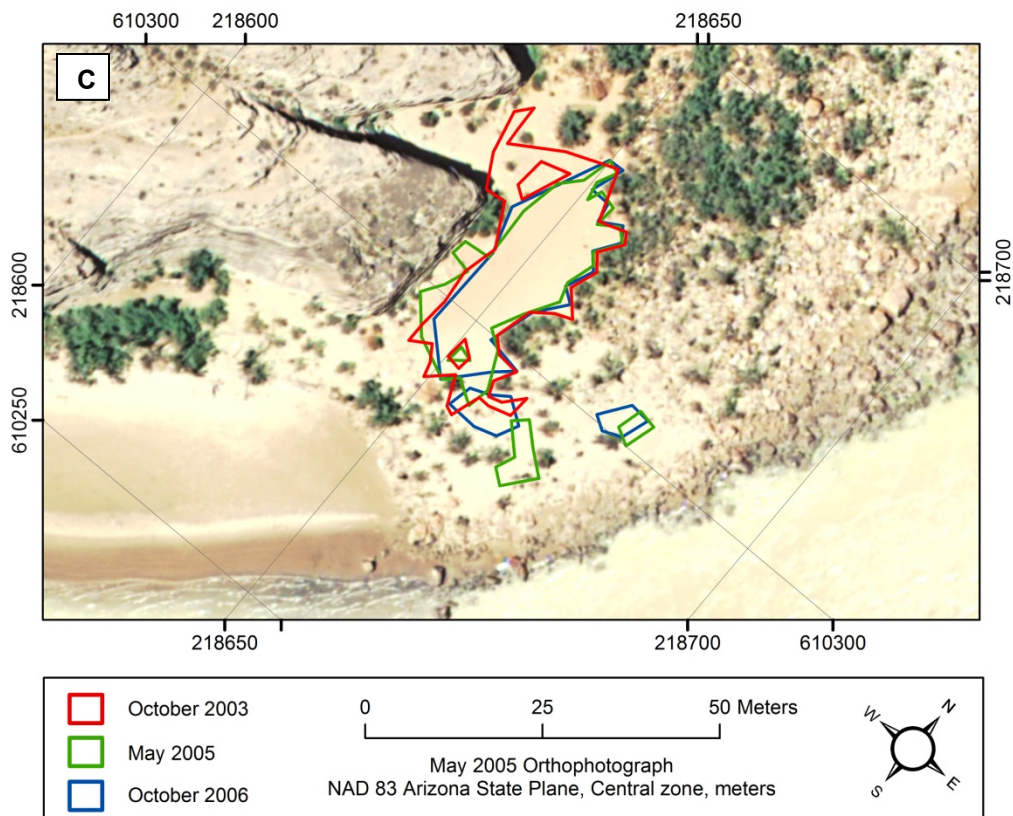


Figure A25. Time series plot showing campsite area at South Canyon camp (River Mile 31.9R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A7 for data.





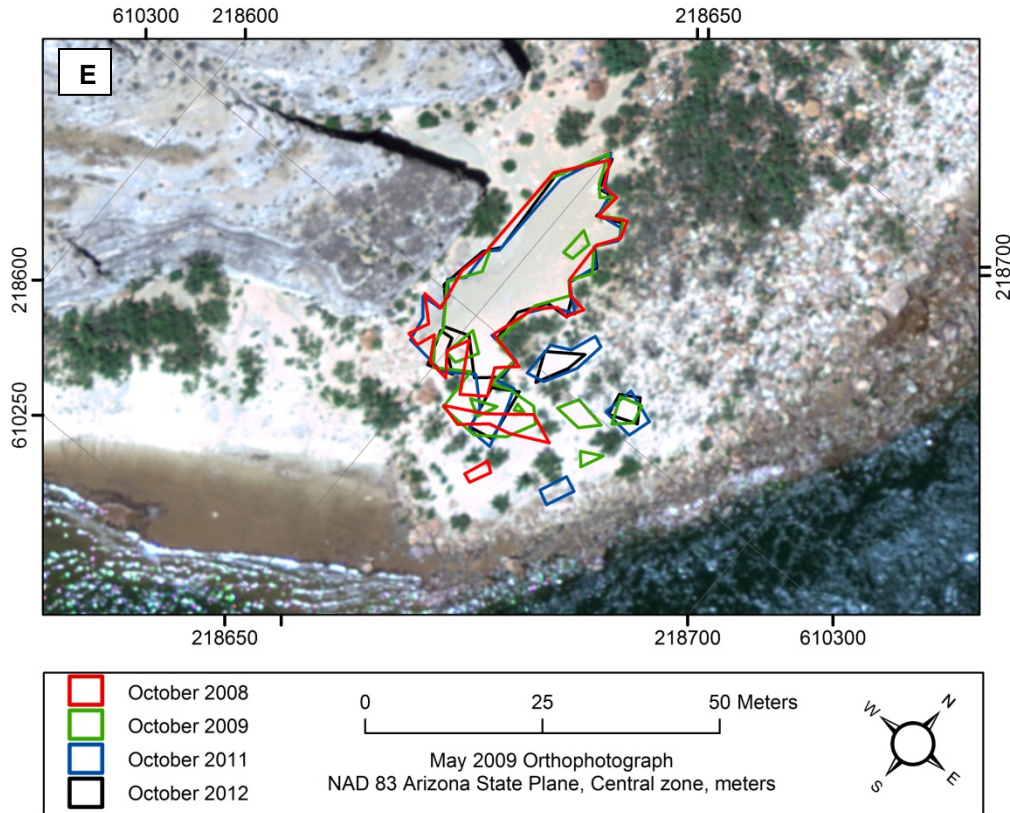


Figure A26. Maps showing campsite areas measured at South Canyon camp (River Mile 31.9R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A27. Remote camera photograph showing South Canyon camp located at River Mile 31.9R. Flow in main channel is from bottom to top. Photograph taken on October 5, 2012.

Campsite Name: Nautiloid

River Mile: 35.0, River Left

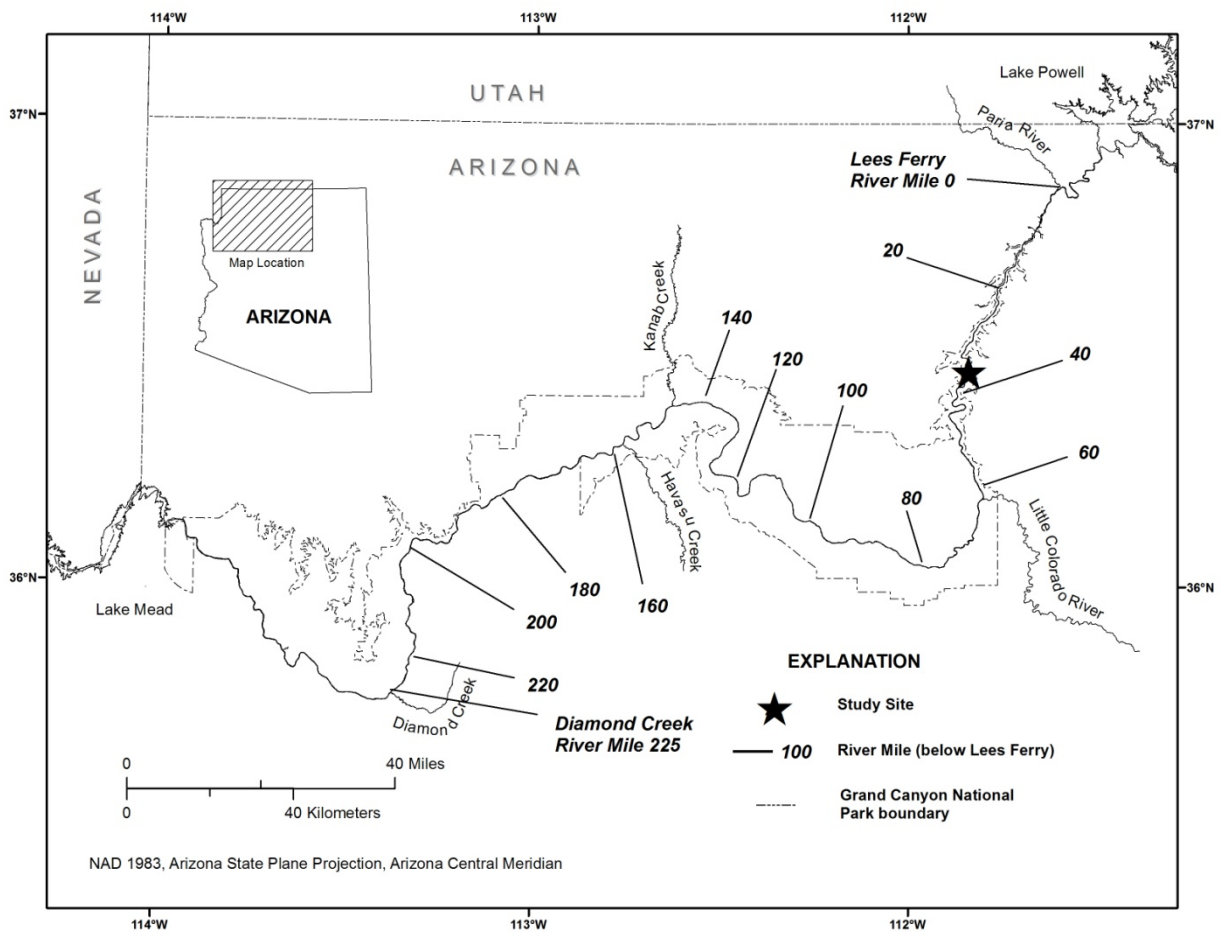


Figure A28. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Nautiloid camp study site (River Mile 35.0L).

Table A8. Campsite area in different stage-elevation zones at Nautiloid camp (River Mile 35.0L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite Area								
	Stage-elevation Zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		18	115	46	390	182	133	618	751
10/5/1999		34	93	23	341	178	127	542	669
10/16/2000	0	127	94	7	329	161	221	497	718
10/7/2001	5	21	61	32	304	132	82	468	550
9/22/2002	0	0	30	2	338	101	30	441	471
4/27/2003	26	57	38	52	362	126	95	540	635
9/22/2003	71	26	13	39	314	93	39	446	484
5/9/2005	203	242	23	38	344	65	265	447	712
10/11/2006	0	0	0	32	372	64	0	468	468
10/16/2007	28	2	23	43	408	63	25	514	539
2/5/2008	0	0	0	17	382	82	0	481	481
3/30/2008	0	43	36	0	354	76	79	430	509
10/13/2008	1	16	14	3	416	71	30	490	520
10/12/2009	10	1	21	11	408	62	22	481	503
10/7/2011		0	7	0	244	10	7	253	260
10/5/2012	32	44	12	5	328	13	56	346	402

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

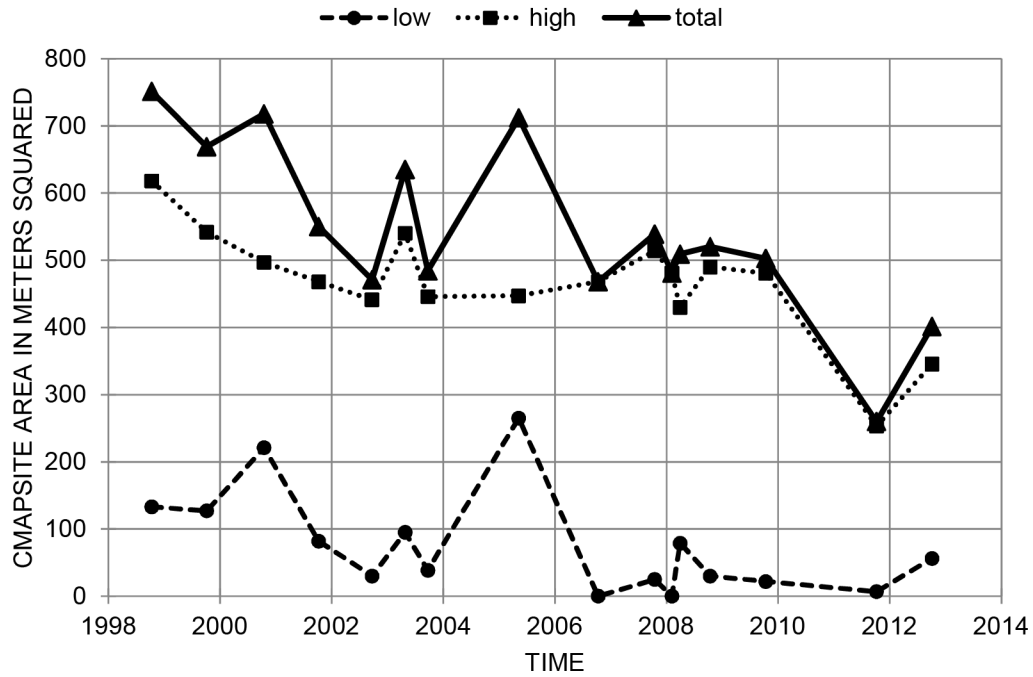
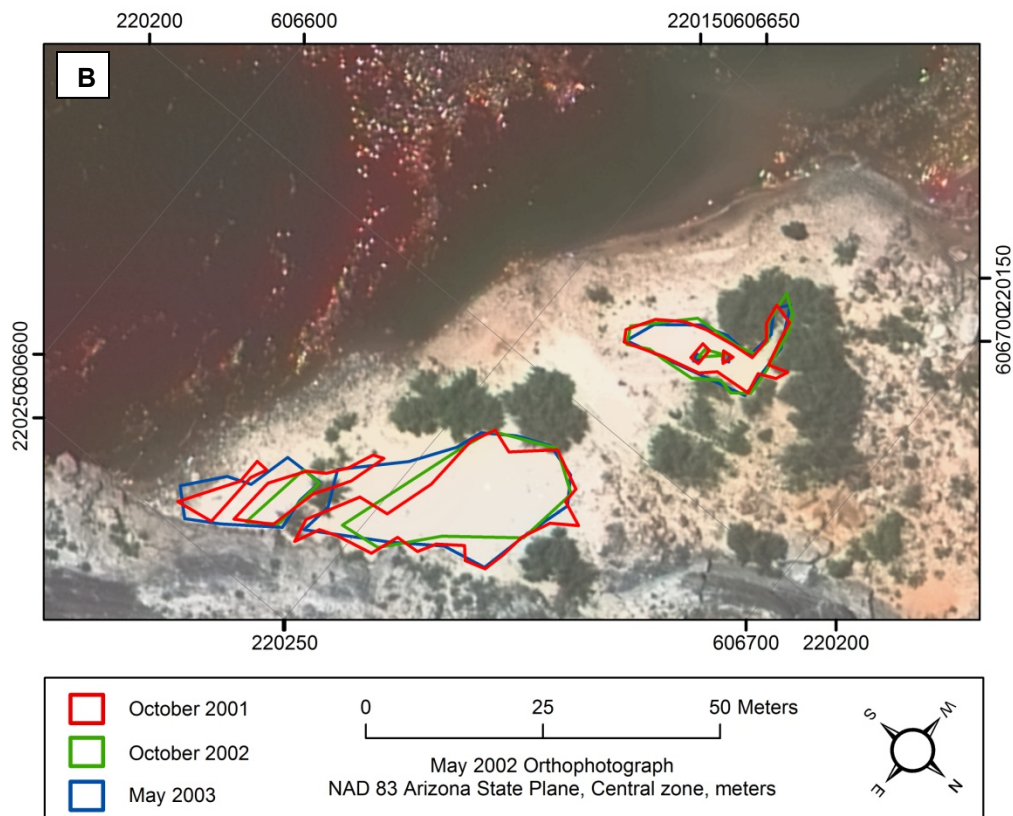
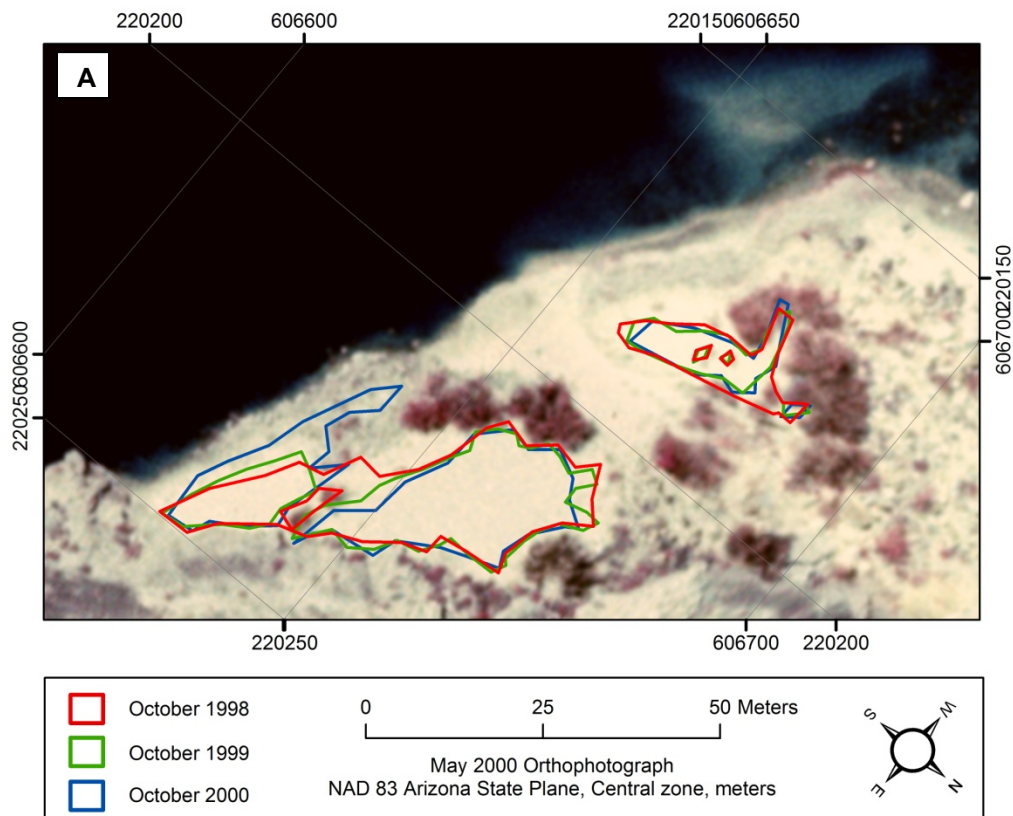
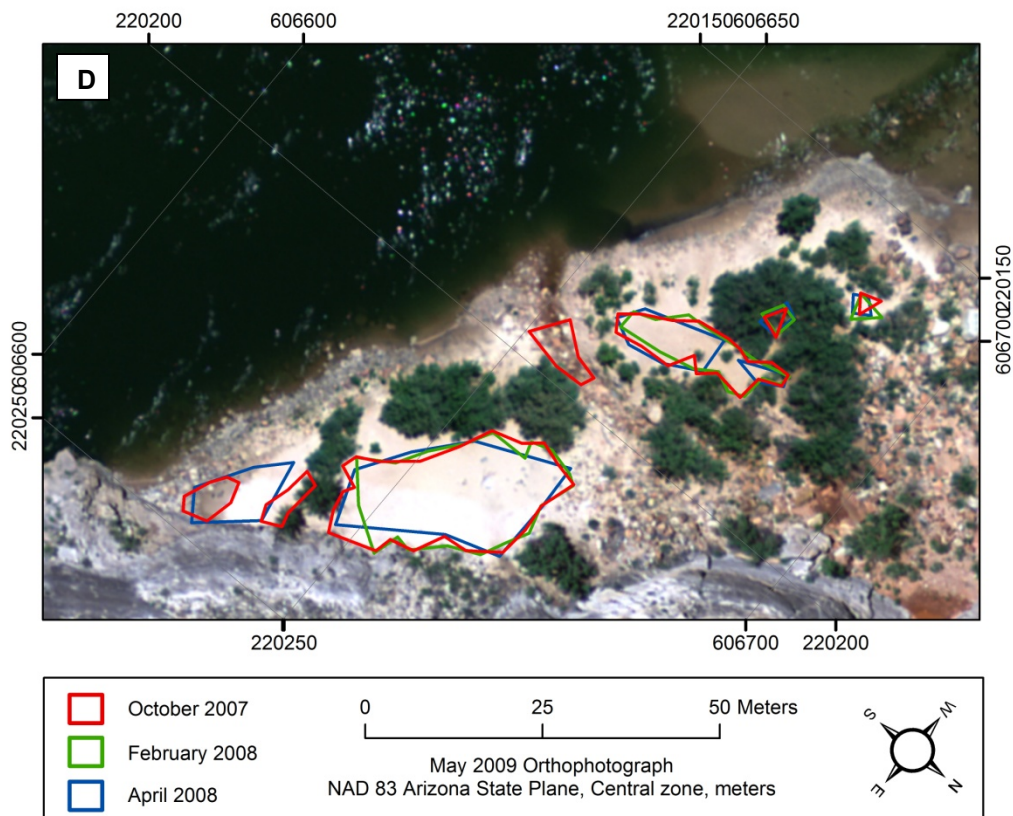
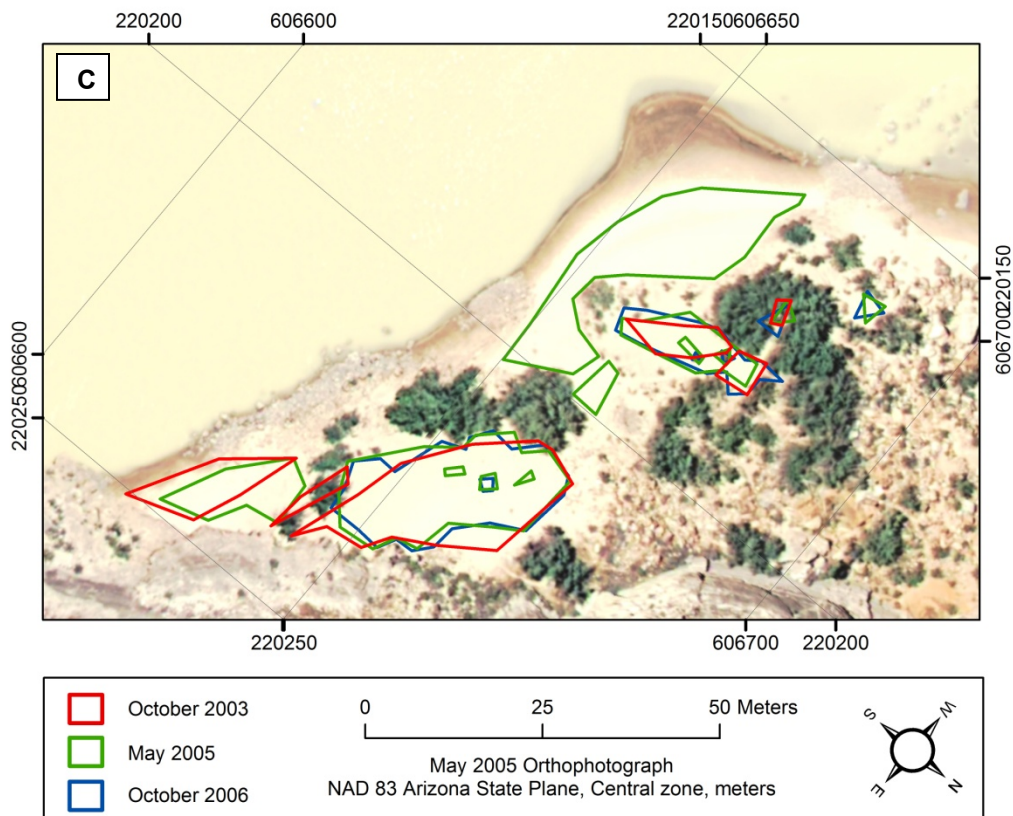


Figure A29. Time series plot showing campsite area at Nautiloid camp (River Mile 35.0L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A8 for data.





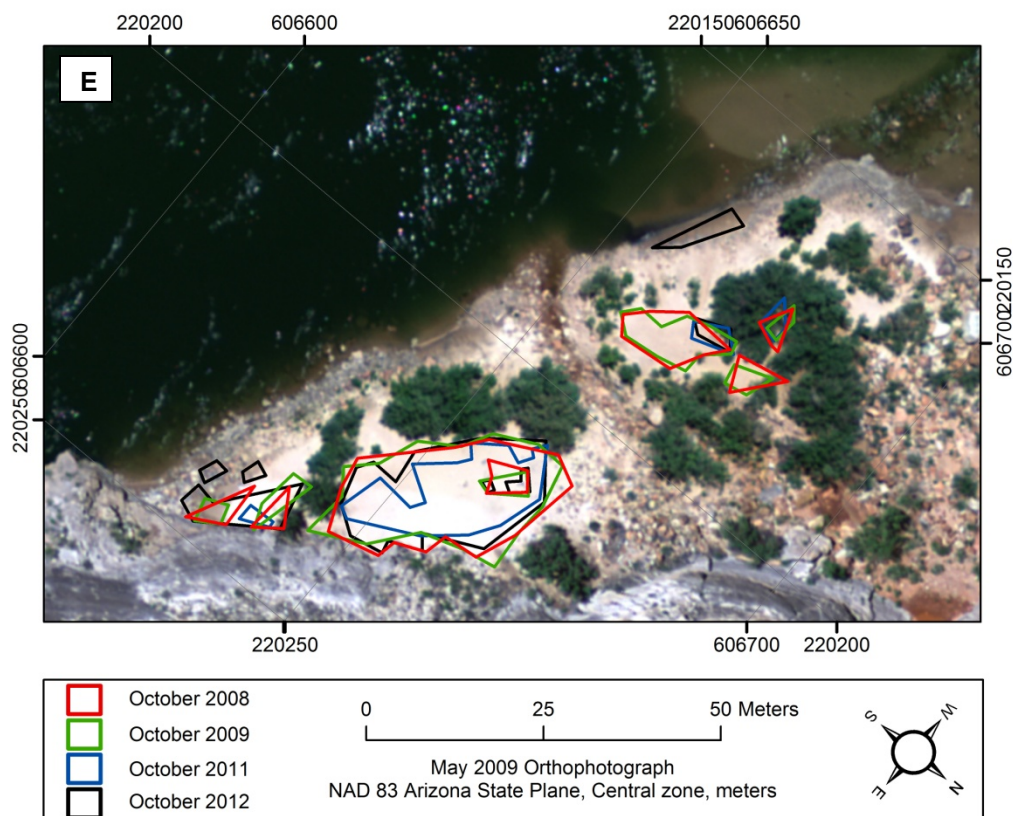


Figure A30. Maps showing campsite areas measured at Nautiloid camp (River Mile 35.0L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.

Campsite Name: Buck Farm

River Mile: 41.2, River Right

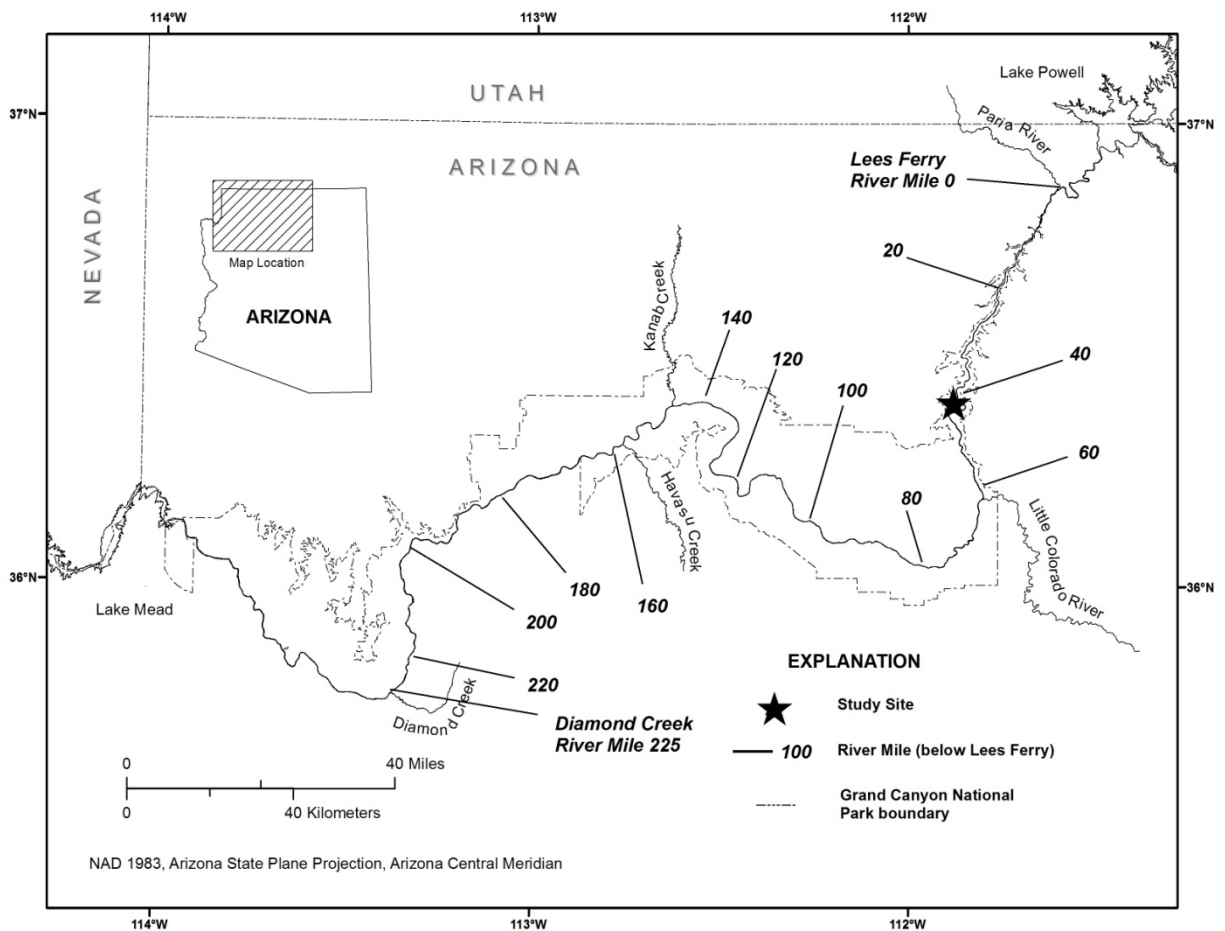


Figure A31. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Buck Farm camp study site (River Mile 41.2R).

Table A9. Campsite area in different stage-elevation zones at Buck Farm camp (River Mile 41.2R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10–15 (m ²)	15–20 (m ²)	20–25 (m ²)	25–30 (m ²)	30–45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
9/23/2002	115	109	91	29	112	384	200	525	725
4/28/2003	100	164	78	0	51	272	242	323	565
9/23/2003	102	138	73	50	159	412	211	621	833
5/10/2005	58	226	32	93	126	190	258	409	666
10/10/2006	108	151	42	4	122	255	193	381	574
10/16/2007	65	153	21	0	61	161	174	222	396
2/5/2008	0	85	19	0	45	184	104	229	333
3/31/2008	0	68	28	51	116	174	96	341	437
10/14/2008	24	36	0	0	54	91	36	145	181
10/13/2009	126	92	13	0	78	155	105	233	338
10/8/2011		61	216	0	50	167	276	217	493
10/6/2012	75	108	39	32	31	112	147	175	321

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

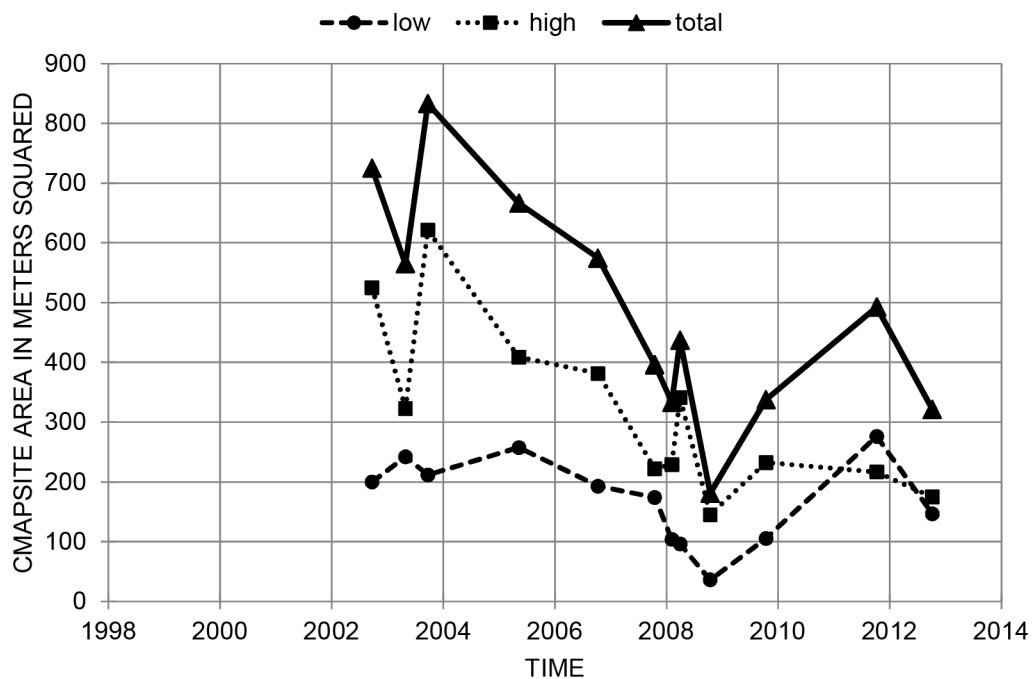
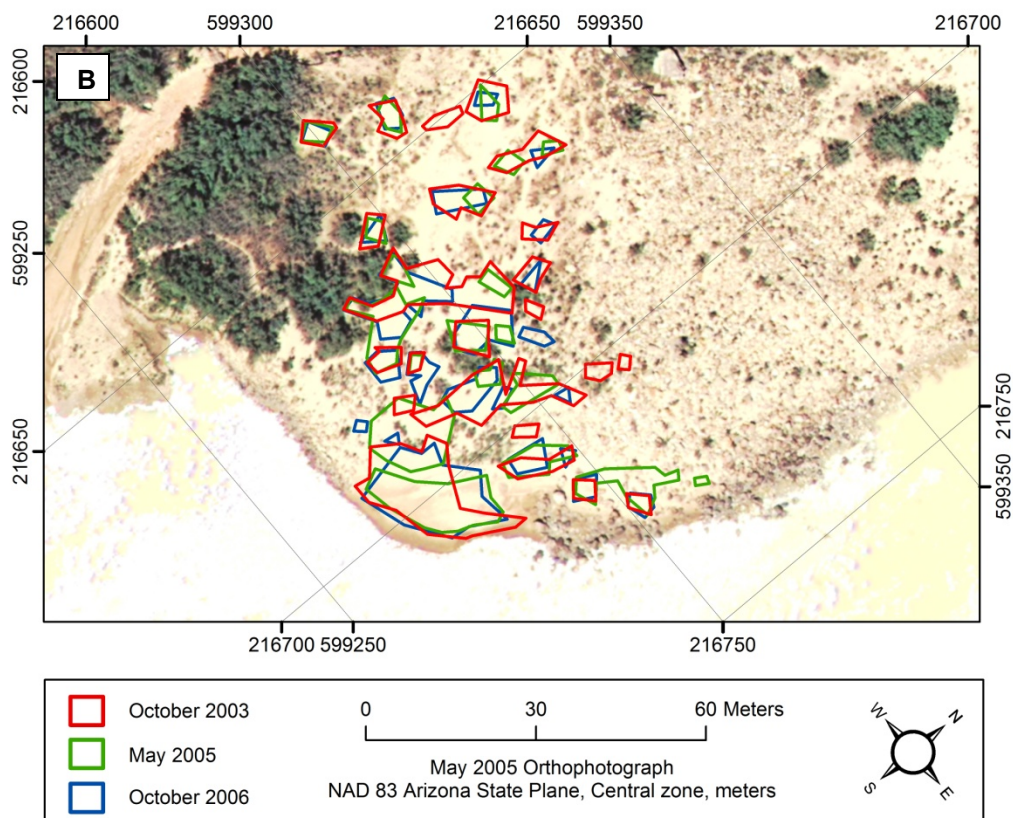
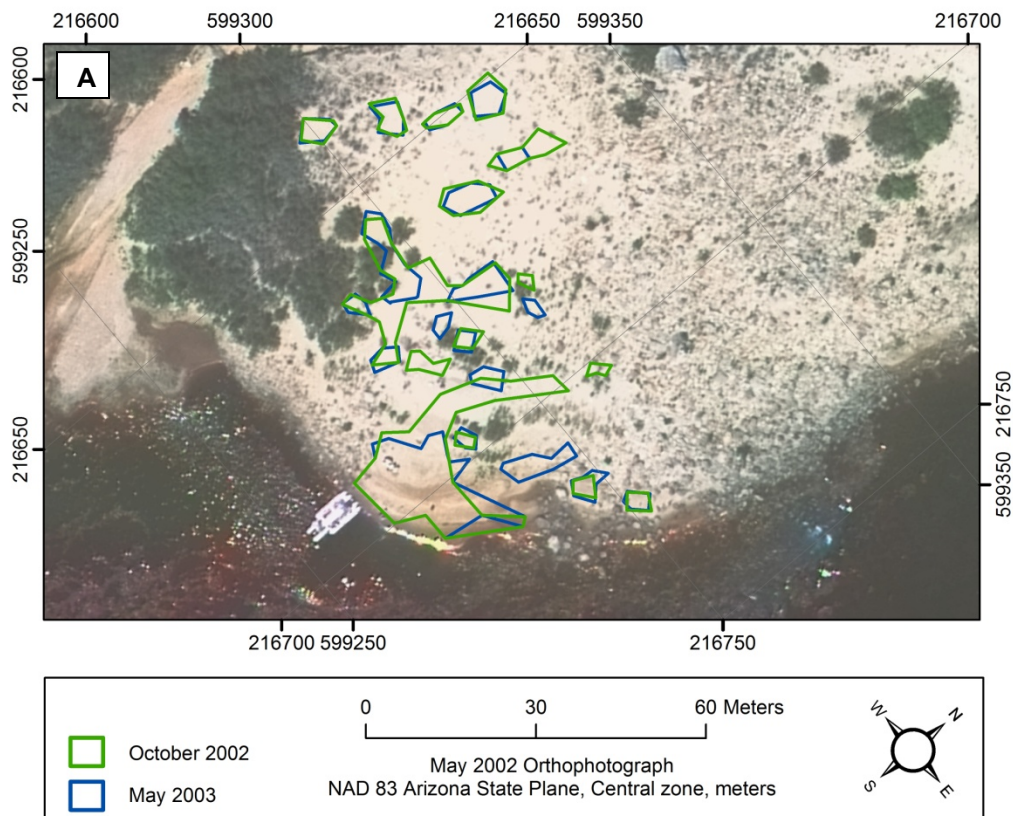


Figure A32. Time series plot showing campsite area at Buck Farm camp (River Mile 41.2R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A9 for data.



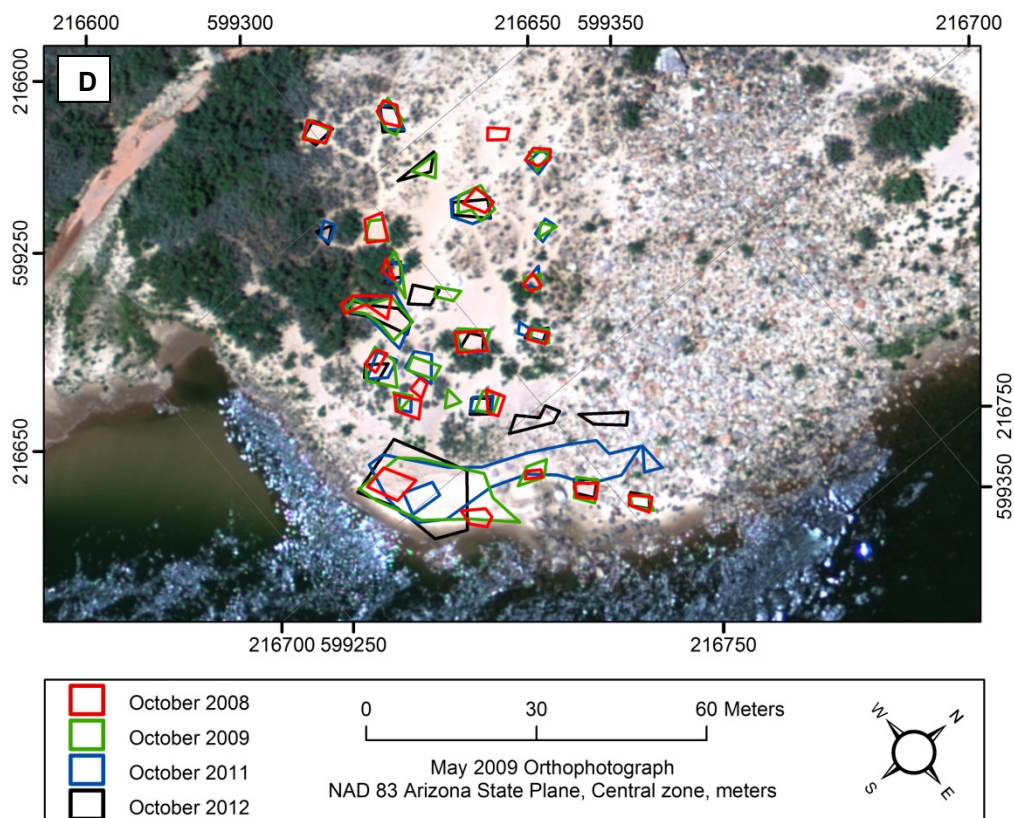
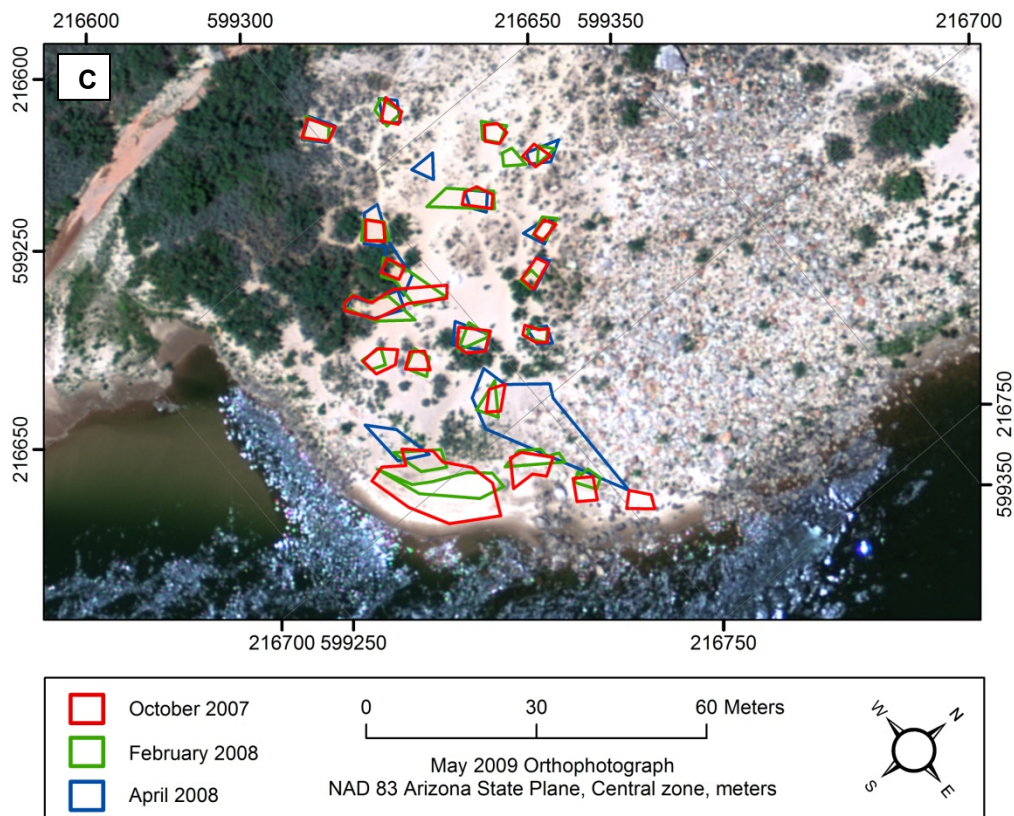


Figure A33. Maps showing campsite areas measured at Buck Farm camp (River Mile 41.2R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively; (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively; (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively; (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.

Campsite Name: Anasazi Bridge

River Mile: 43.4, River Left

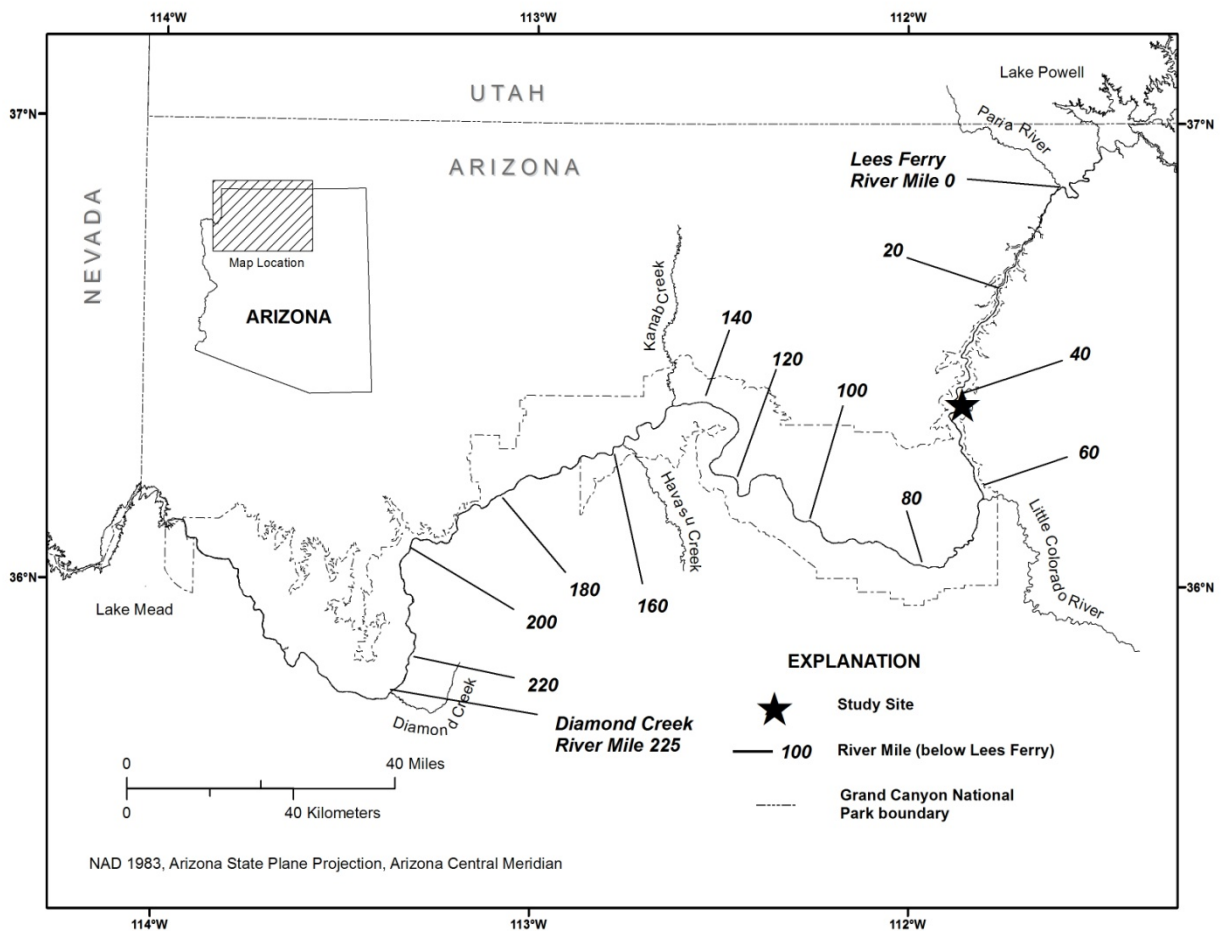


Figure A34. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Anasazi Bridge camp study site (River Mile 43.4L).

Table A10. Campsite area in different stage-elevation zones at Anasazi Bridge camp (River Mile 43.4L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	56	710	280	0	1045	1045
10/5/1999		0	0	62	752	200	0	1014	1014
10/17/2000	5	248	82	30	754	149	330	933	1263
10/7/2001	0	22	0	37	358	131	22	526	548
9/24/2002	0	0	0	33	355	117	0	505	505
4/29/2003	0	0	0	26	57	58	0	141	141
9/23/2003	85	10	0	27	55	44	10	126	136
5/10/2005	0	0	0	0	90	44	0	134	134
10/10/2006	0	0	0	0	103	45	0	147	147
10/16/2007	0	0	0	0	128	54	0	182	182
2/6/2008	0	0	0	0	136	48	0	184	184
3/31/2008	0	3	0	21	351	20	3	392	395
10/14/2008	0	0	0	13	208	26	0	247	247
10/13/2009	118	0	6	54	193	32	6	279	285
10/8/2011		13	135	52	122	18	148	192	340
10/6/2012	0	0	1	44	78	11	1	133	134

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

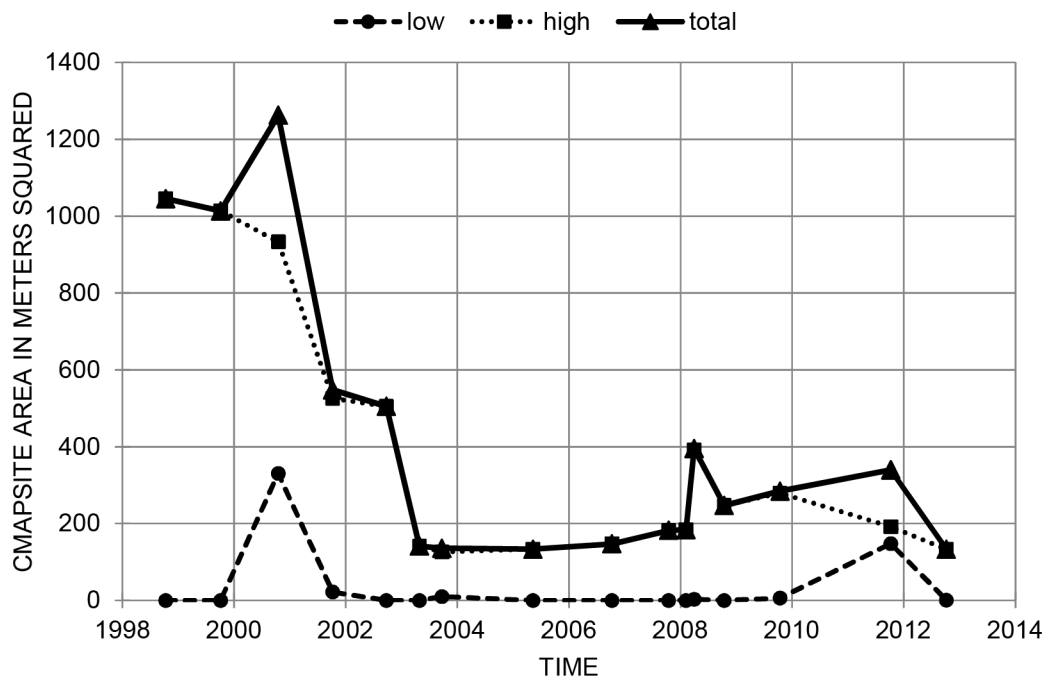
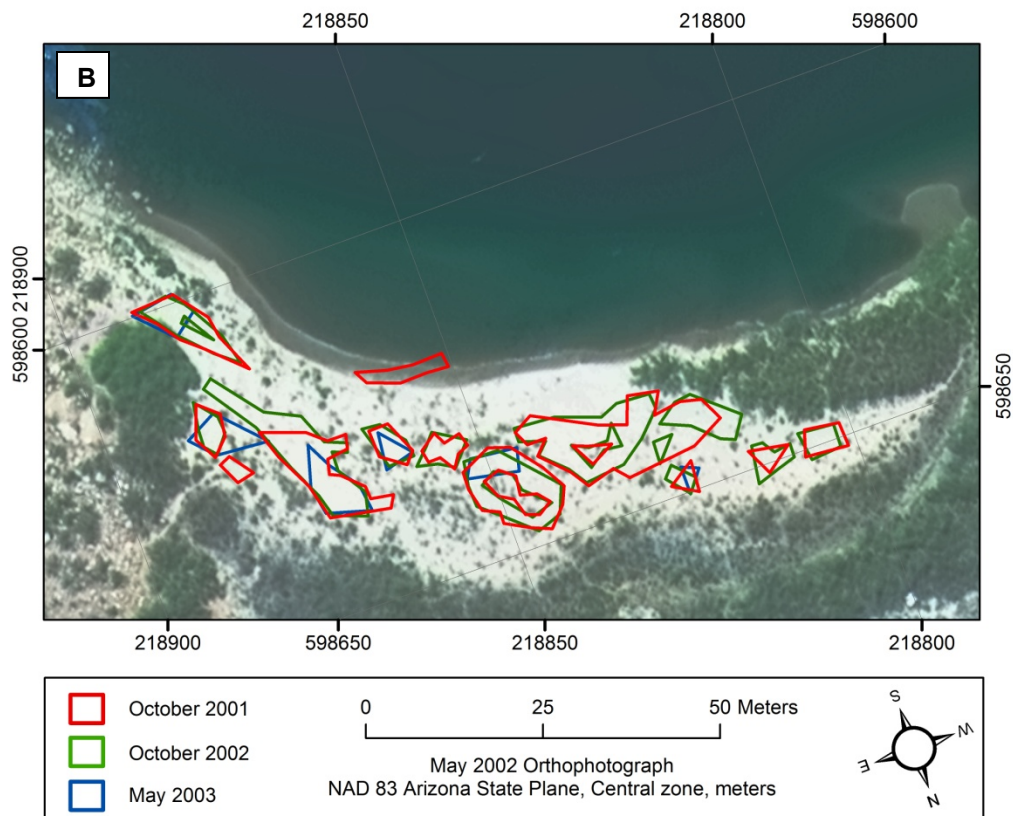
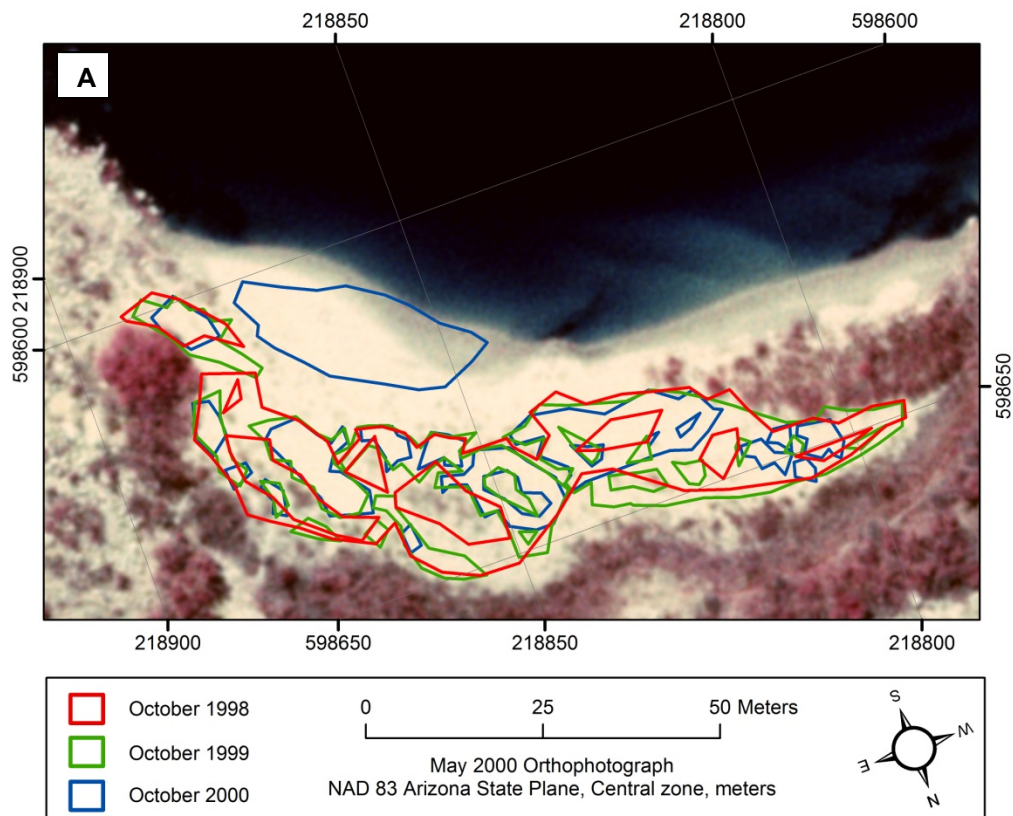
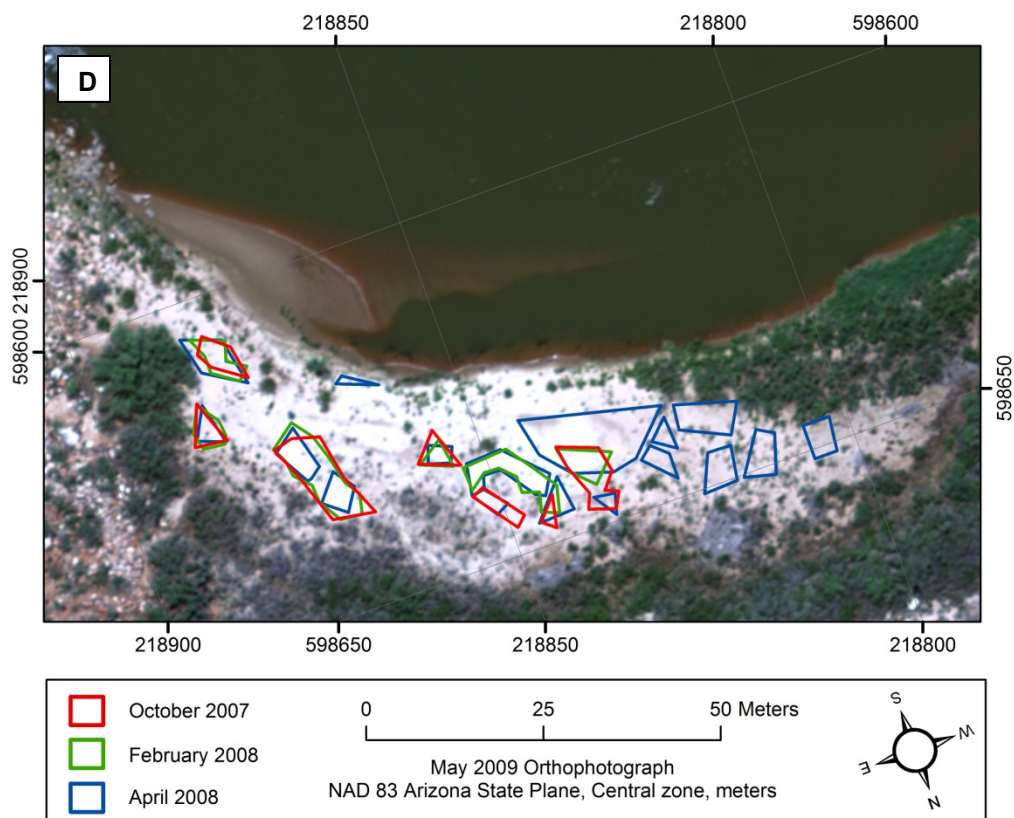
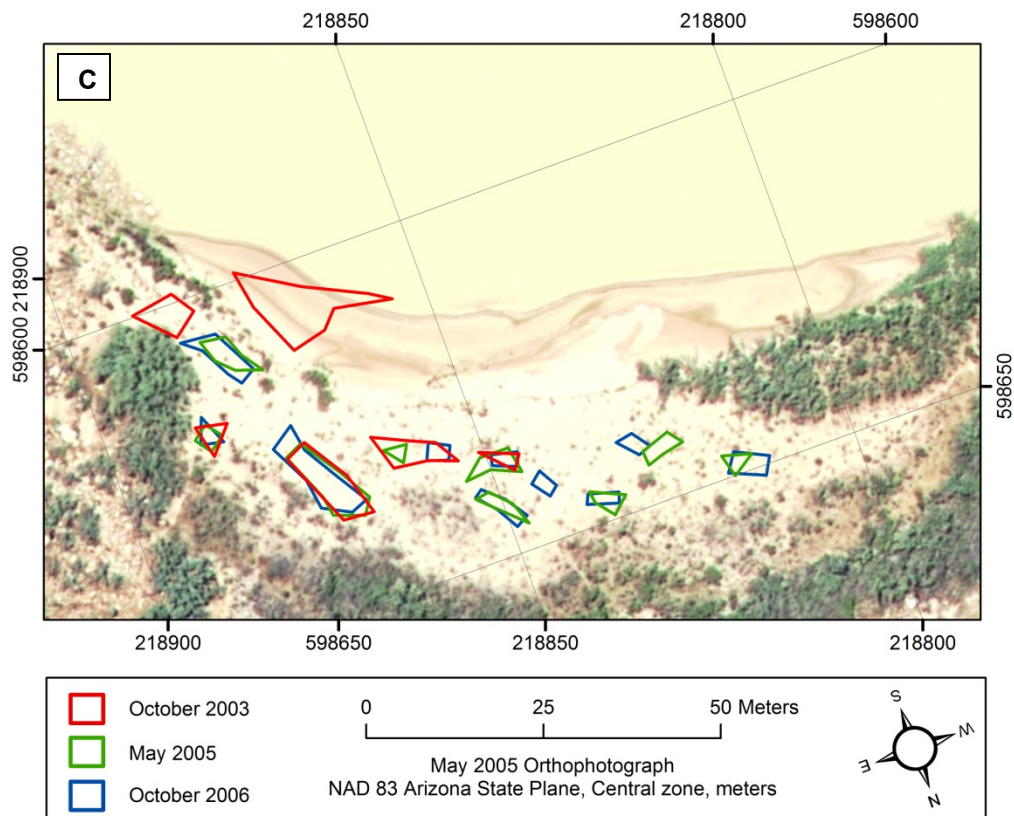


Figure A35. Time series plot showing campsite area at Anasazi Bridge camp (River Mile 43.4L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A10 for data.





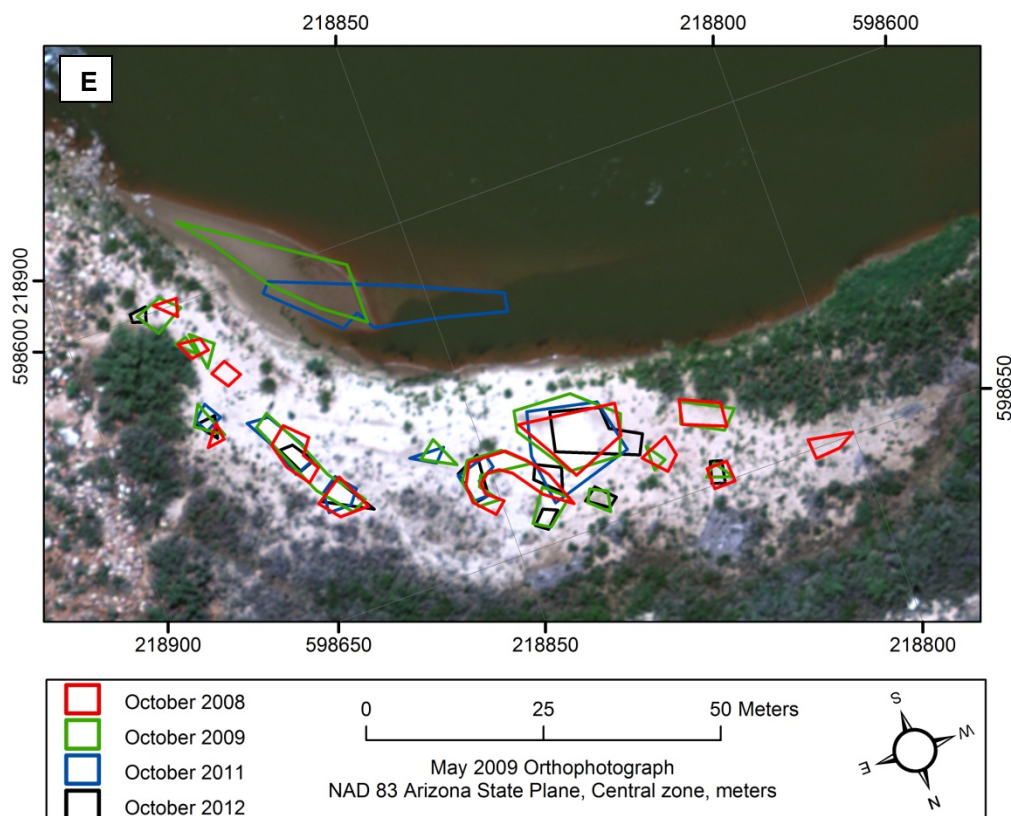


Figure A36. Maps showing campsite areas measured at Anasazi Bridge camp (River Mile 43.4L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A37. Remote-camera photograph showing Anasazi Bridge camp located at River Mile 43.4L. Flow in main channel is from left to right. Photograph taken on October 7, 2012.

Campsite Name: Eminence

River Mile: 44.5, River Left

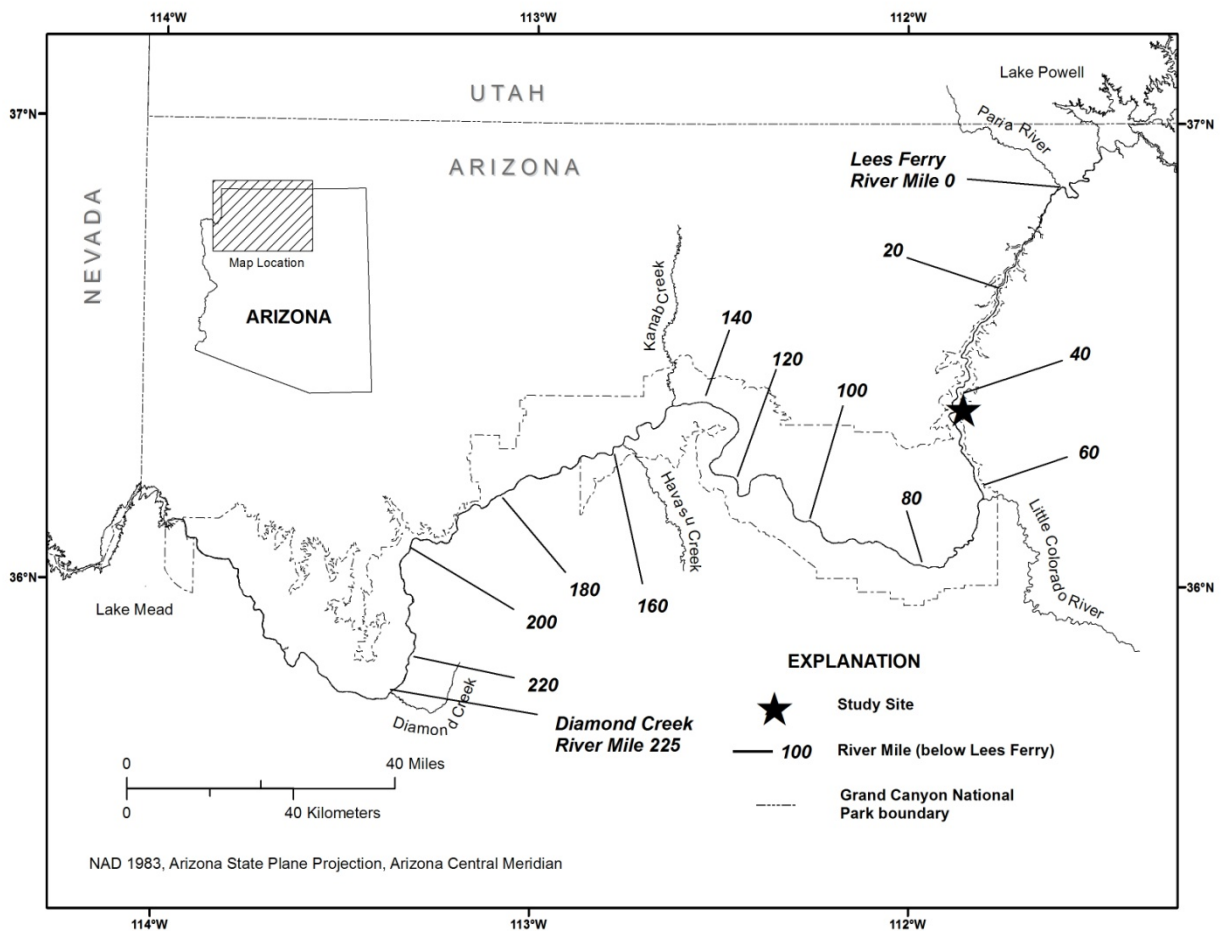


Figure A38. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Eminence camp study site (River Mile 44.5L).

Table A11. Campsite area in different stage-elevation zones at Eminence camp (River Mile 44.5L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	182	0	263	336	182	599	781
10/6/1999		0	128	0	240	386	128	626	754
10/17/2000	26	320	108	2	231	301	428	534	962
10/8/2001	183	284	29	0	184	344	313	528	841
9/24/2002	219	11	0	0	199	369	11	568	579
4/30/2003	299	307	36	0	209	370	344	579	922
9/23/2003	522	134	14	3	244	498	148	745	893
5/10/2005	88	411	59	36	156	269	470	461	931
10/10/2006	214	119	12	0	139	298	131	437	568
10/16/2007	297	109	0	6	112	254	109	372	481
2/6/2008	142	257	0	7	150	419	257	576	833
3/31/2008	19	10	239	200	219	343	249	762	1011
10/14/2008	46	152	23	5	189	377	175	571	746
10/13/2009	291	43	0	0	141	309	43	450	493
10/8/2011		184	186	0	96	237	370	333	704
10/6/2012	346	244	99	0	131	337	343	468	811

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

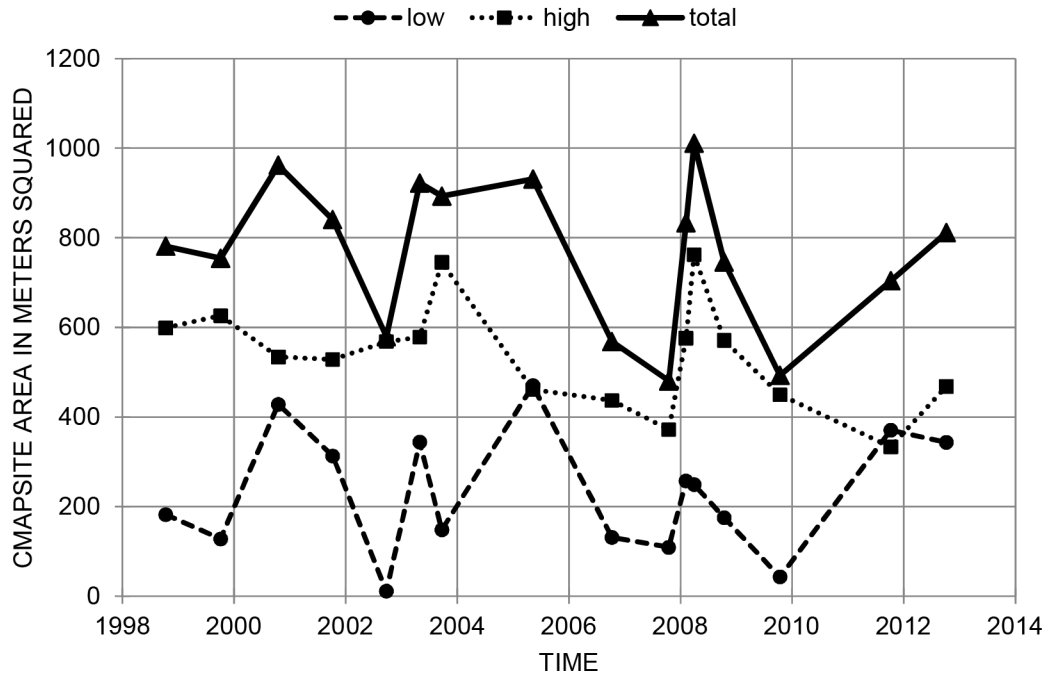
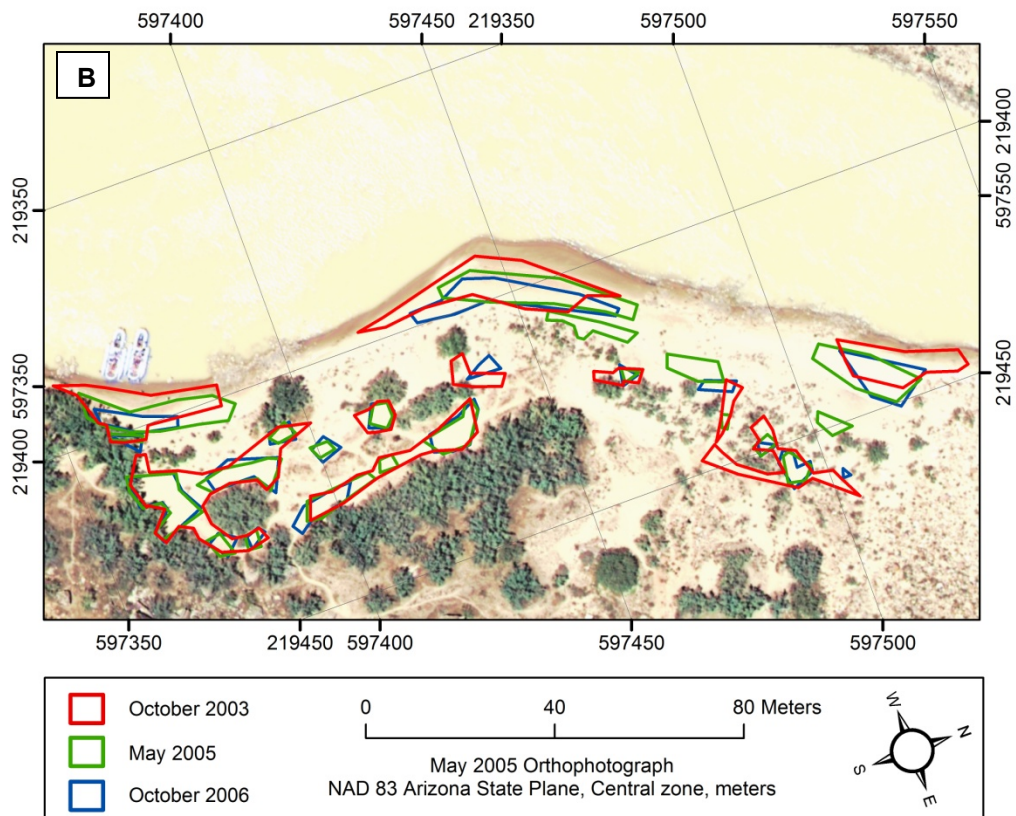
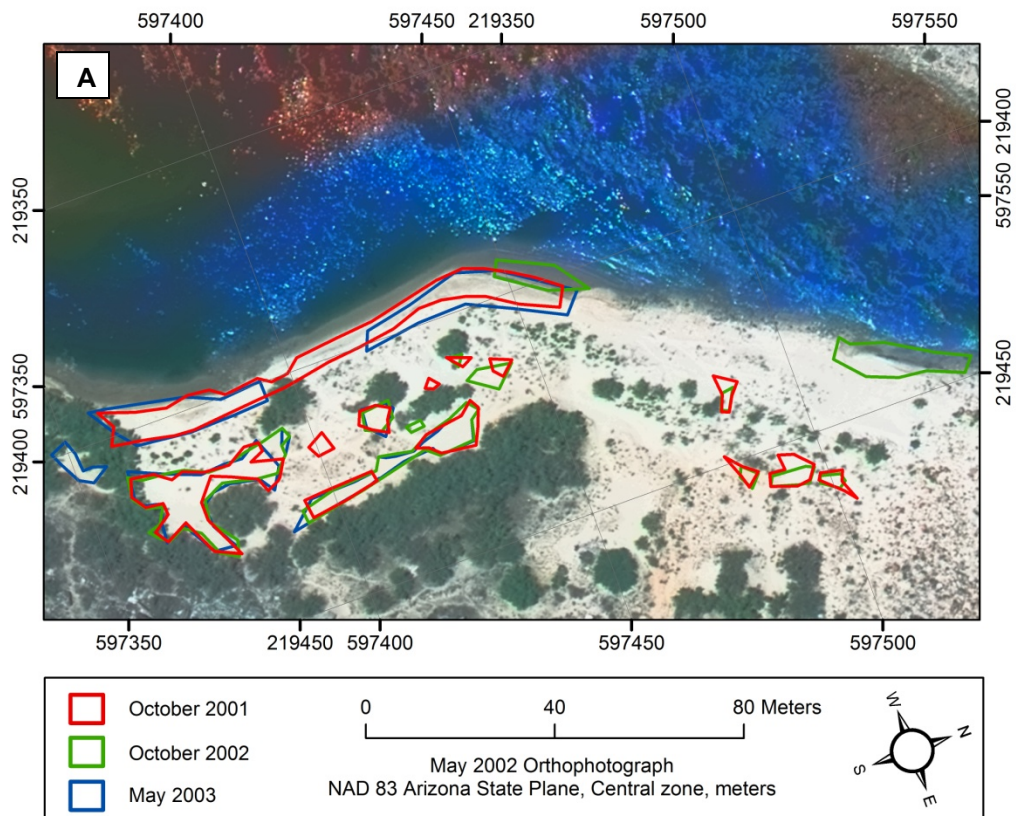


Figure A39. Time series plot showing campsite area at Eminence camp (River Mile 44.5L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A11 for data.



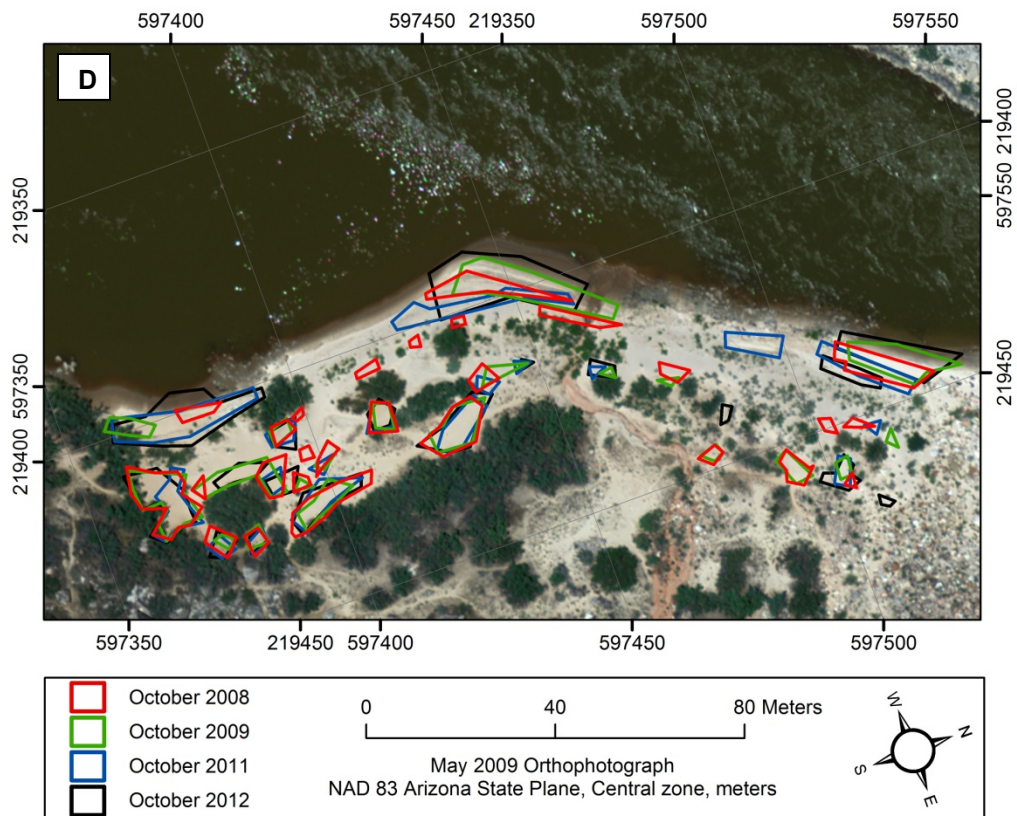
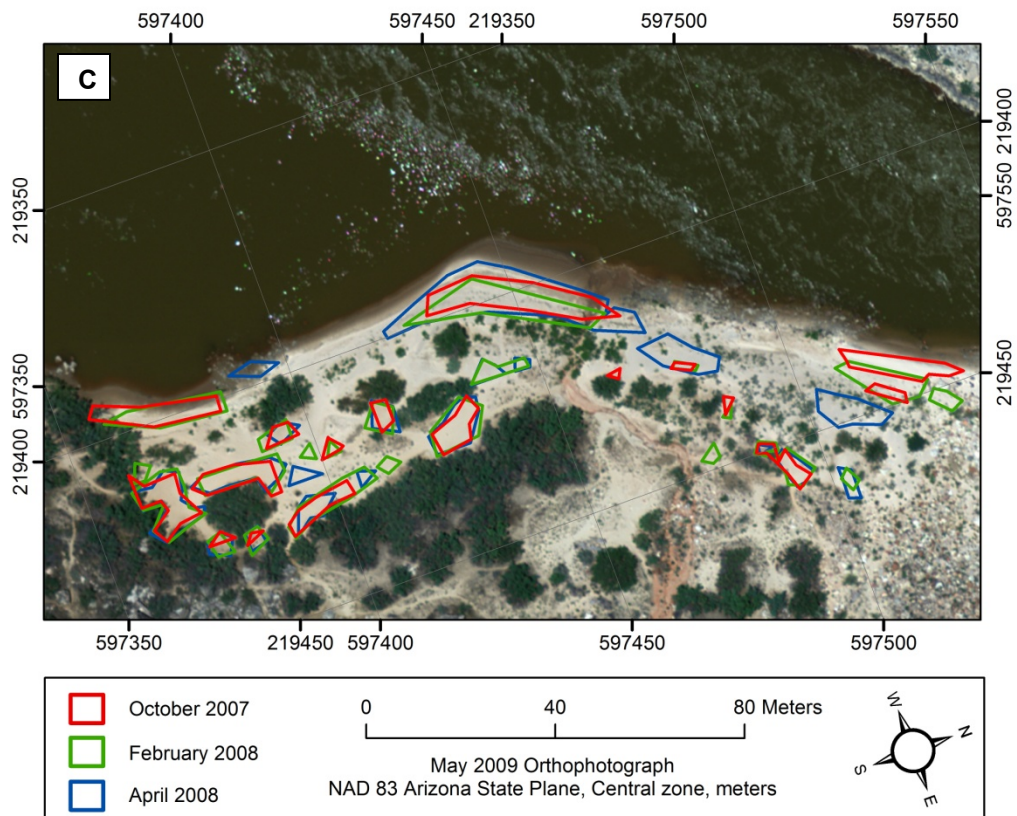


Figure A40. Maps showing campsite areas measured at Eminence camp (River Mile 44.5L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A41. Remote-camera photographs showing Eminence camp at River Mile 44.5L. Flow in main channel is from left to right. (A) Photograph taken on October 12, 1998; (B) Photograph taken on October 6, 2012.

Campsite Name: Willy Taylor

River Mile: 45.0, River Left

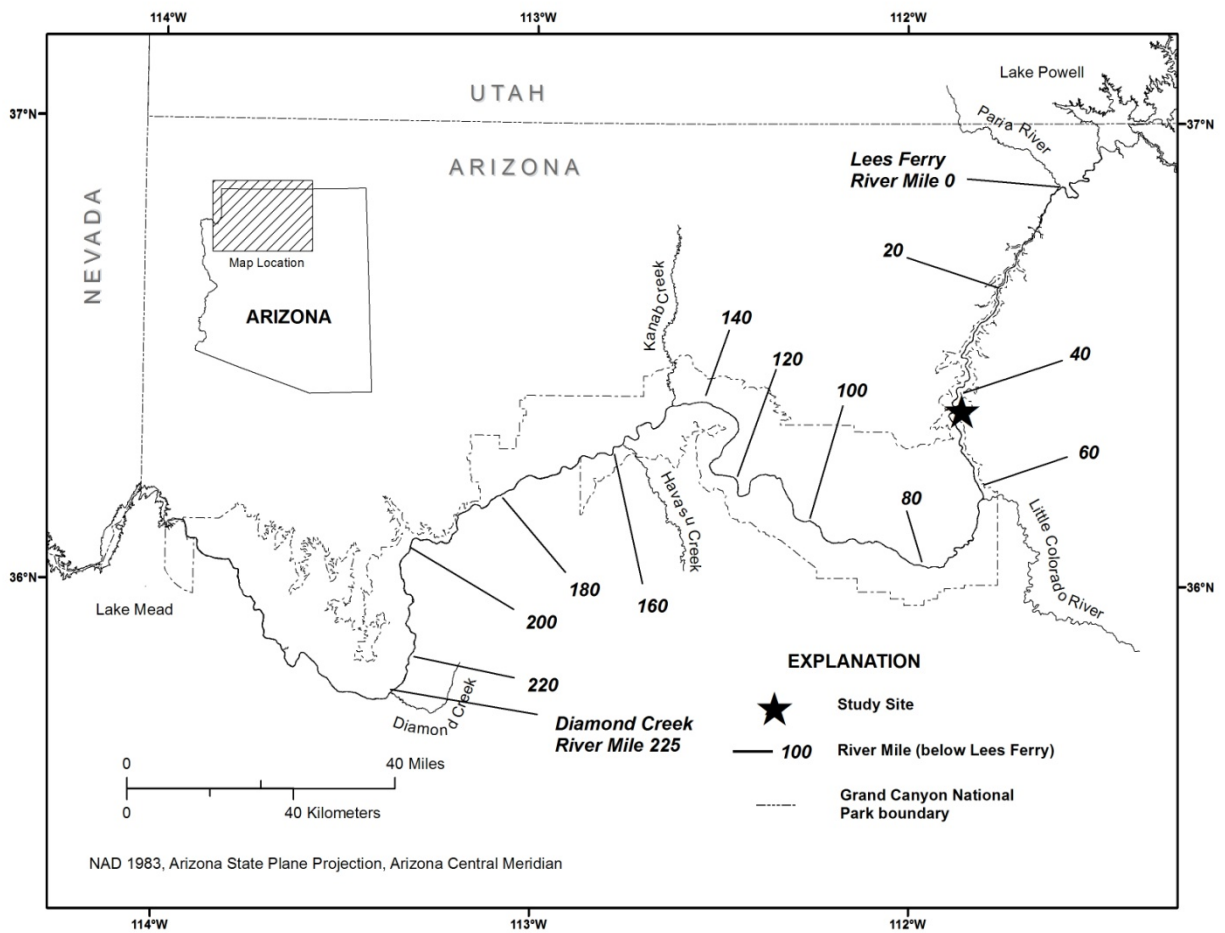


Figure A42. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Willy Taylor camp study site (River Mile 45.0L).

Table A12. Campsite area in different stage-elevation zones at Willy Taylor camp (River Mile 45.0L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
9/24/2002	631	4	0	0	66	117	4	183	187
4/30/2003	871	443	0	0	81	103	443	184	627
9/24/2003	875	428	0	0	22	52	428	74	502
5/11/2005	0	0	116	188	460	130	116	778	894
10/11/2006	0	0	0	0	82	181	0	263	263
10/17/2007	0	0	0	1	19	15	0	35	35
2/7/2008	0	0	0	0	97	166	0	263	263
3/31/2008	0	549	599	572	717	131	1148	1420	2568
10/15/2008	43	64	0	117	561	88	64	766	830
10/14/2009	434	57	0	11	103	78	57	191	248
10/9/2011		0	0	0	104	13	0	117	117
10/7/2012	869	268	0	0	34	52	268	86	354

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

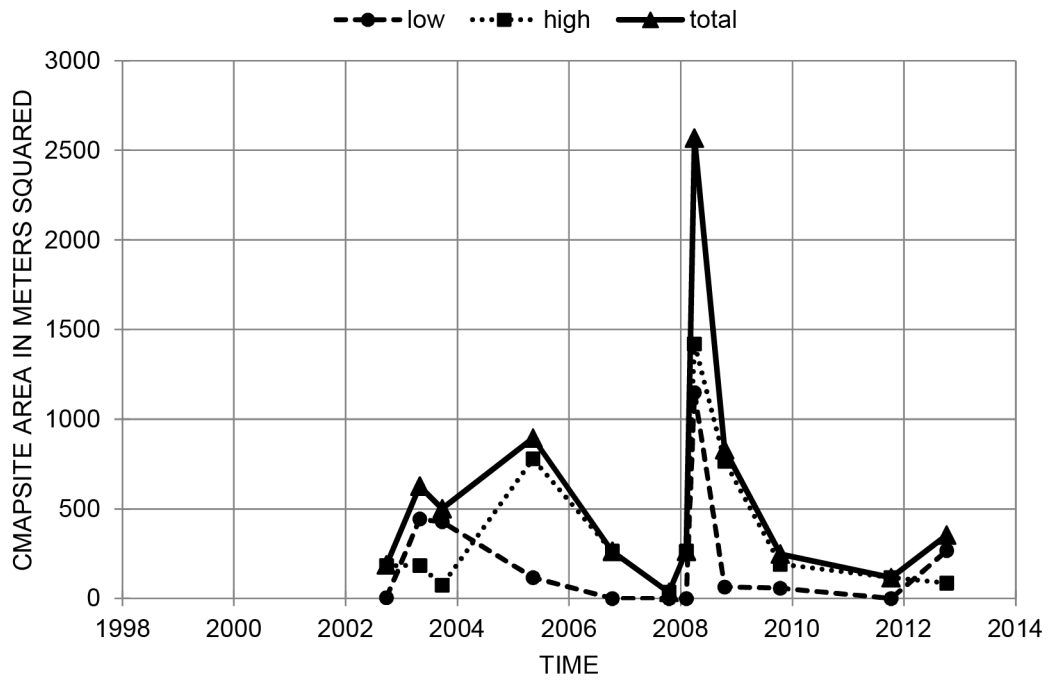
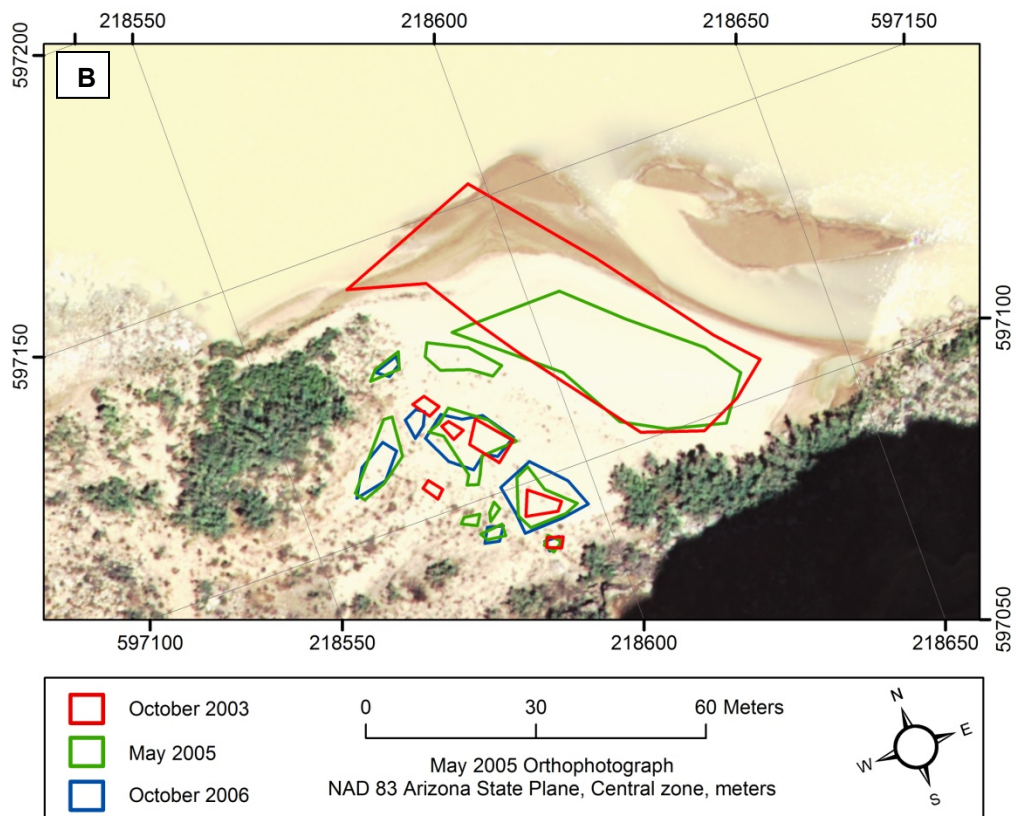
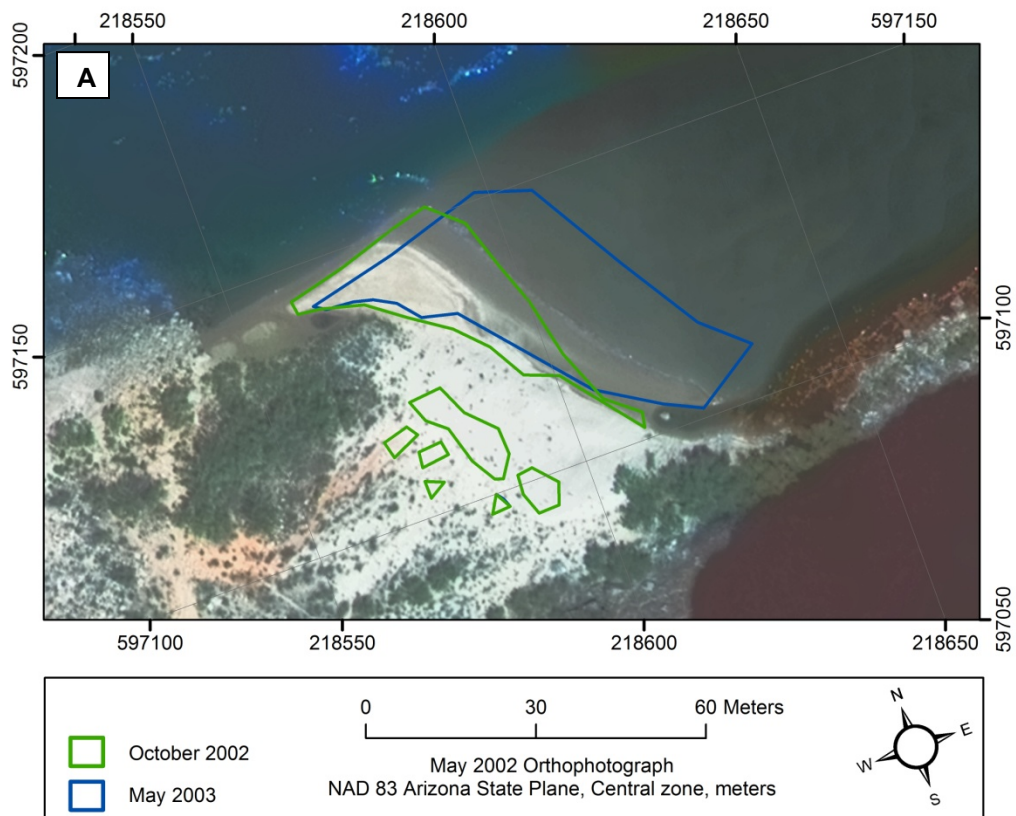


Figure A43. Time series plot showing campsite area at Willy Taylor camp (River Mile 45.0L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A12 for data.



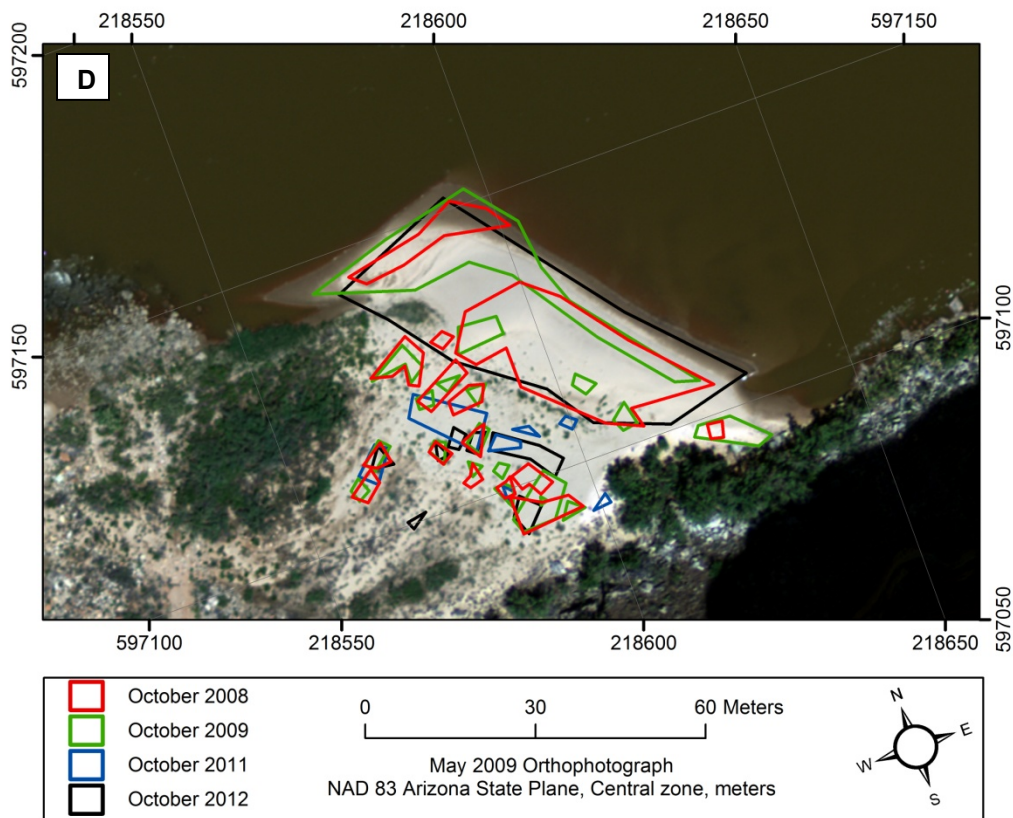
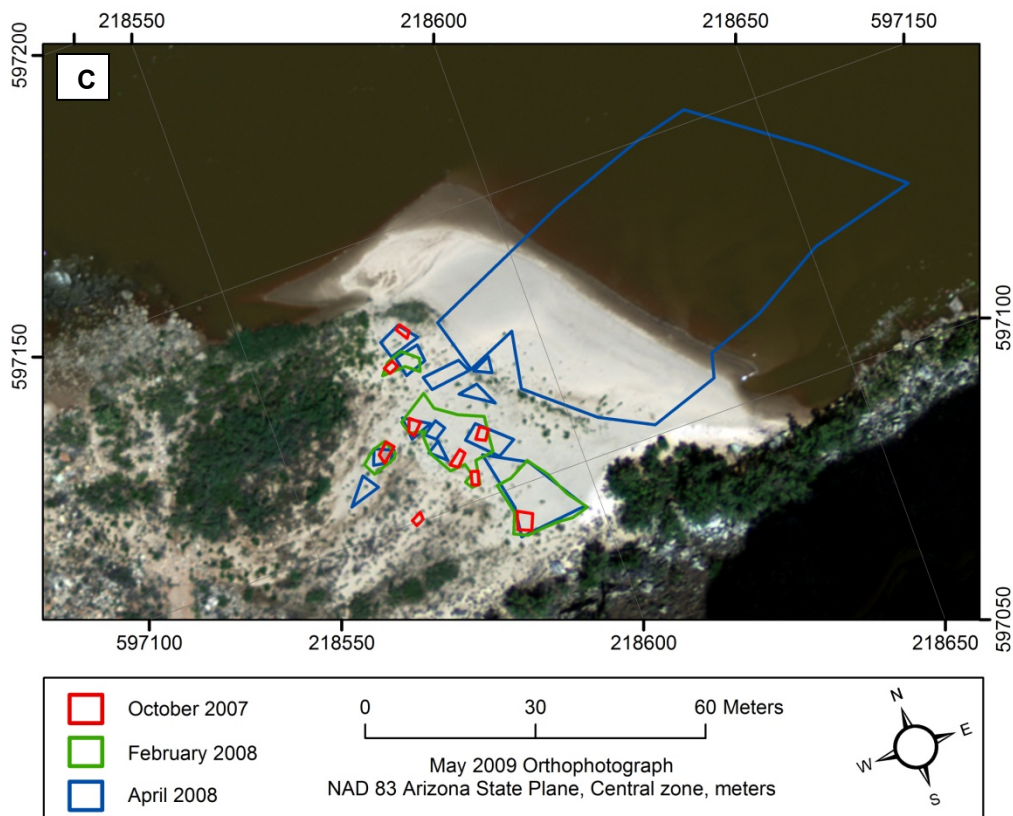


Figure A44. Maps showing campsite areas measured at Willy Taylor camp (River Mile 45.0L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively; (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively; (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively; (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A45. Remote camera photograph showing of Willy Taylor camp located at River Mile 45.0L. Flow in main channel is from left to right. Photograph taken on October 7, 2012.

Campsite Name: Lower Saddle

River Mile: 47.6, River Right

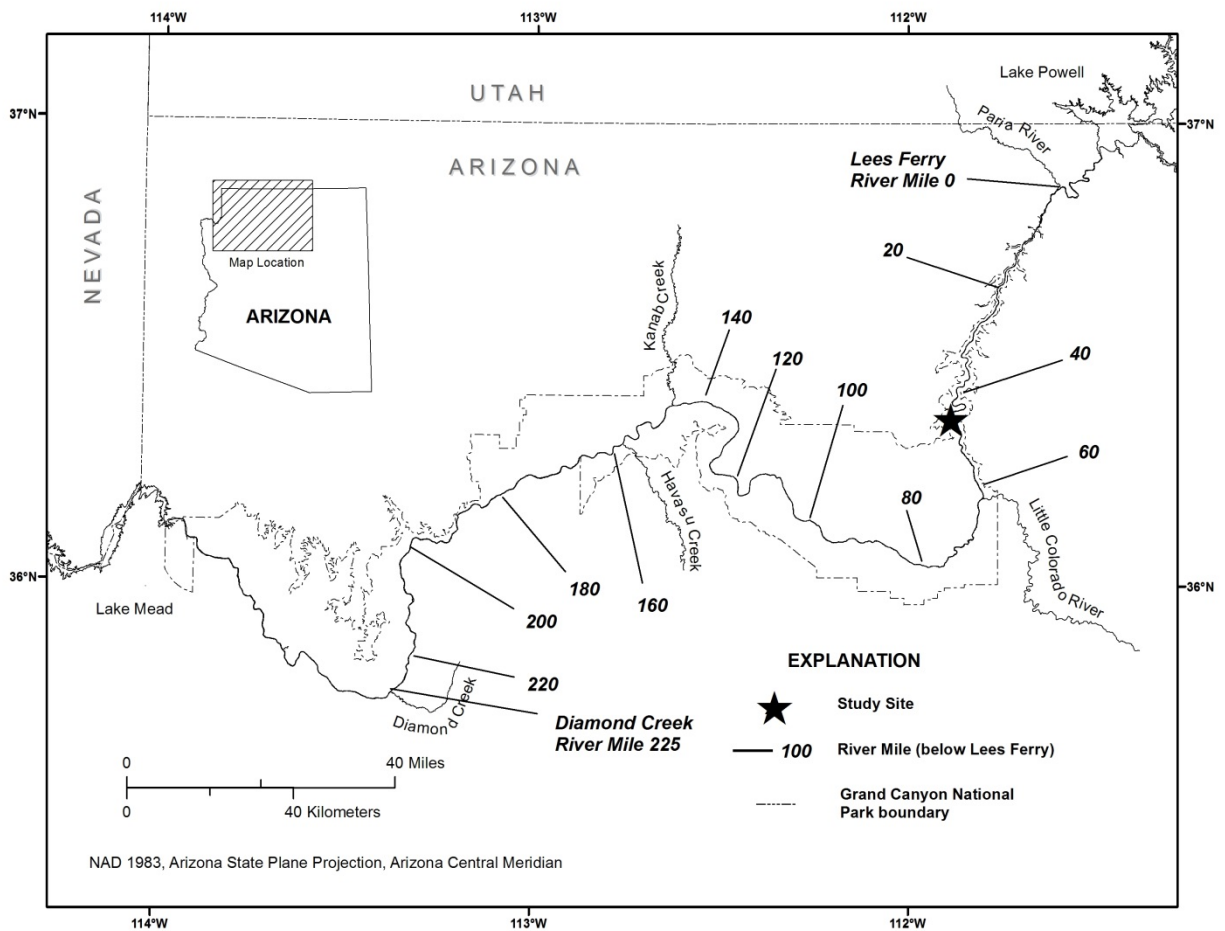


Figure A46. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Lower Saddle camp study site (River Mile 47.6R).

Table A13. Campsite area in different stage-elevation zones at Lower Saddle camp (River Mile 47.6R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998				176	232	357		765	
10/7/1999				189	212	399		799	
10/8/2001	528	158	83	67	0	202	241	269	510
9/24/2002	1111	0	0	0	0	199	0	199	199
4/30/2003	2	59	4	0	0	141	63	141	204
9/24/2003	152	218	195	136	91	132	413	359	772
5/11/2005	2	302	233	121	0	91	535	212	747
10/11/2006	22	273	345	123	17	132	619	272	890
10/17/2007	126	148	262	140	0	96	410	236	646
2/7/2008	0	343	374	230	0	155	717	385	1102
4/1/2008	151	880	957	739	277	76	1837	1092	2929
10/15/2008	168	69	163	140	153	37	232	330	562
10/14/2009	849	3	57	197	18	49	60	264	324
10/9/2011		0	13	142	50	74	13	267	280
10/7/2012	1528	765	37	83	83	68	802	233	1035

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

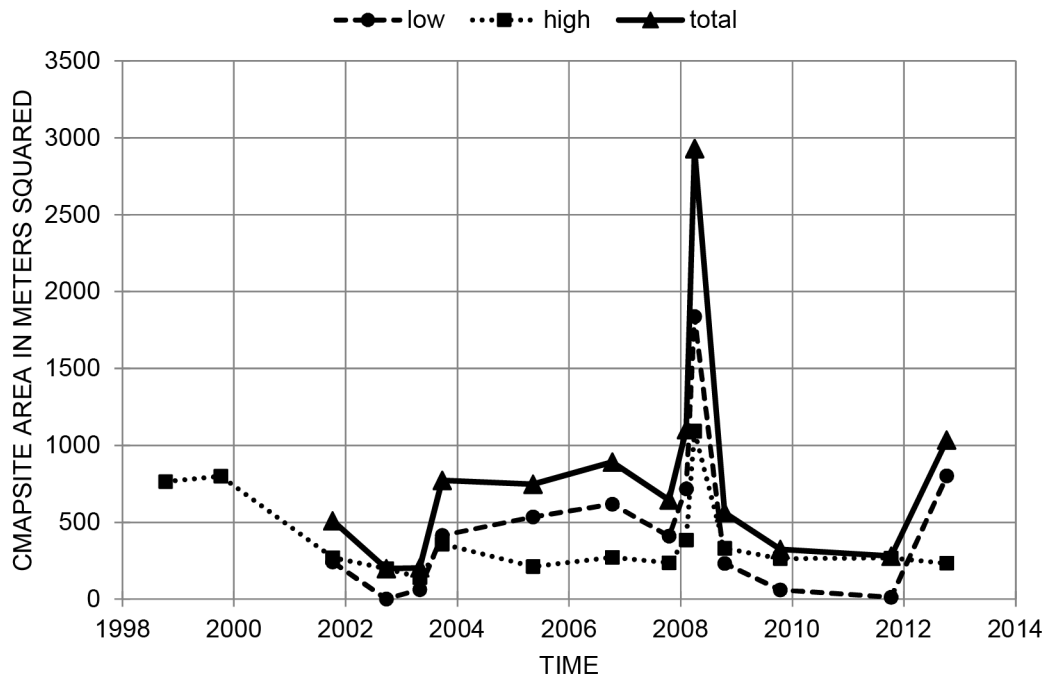
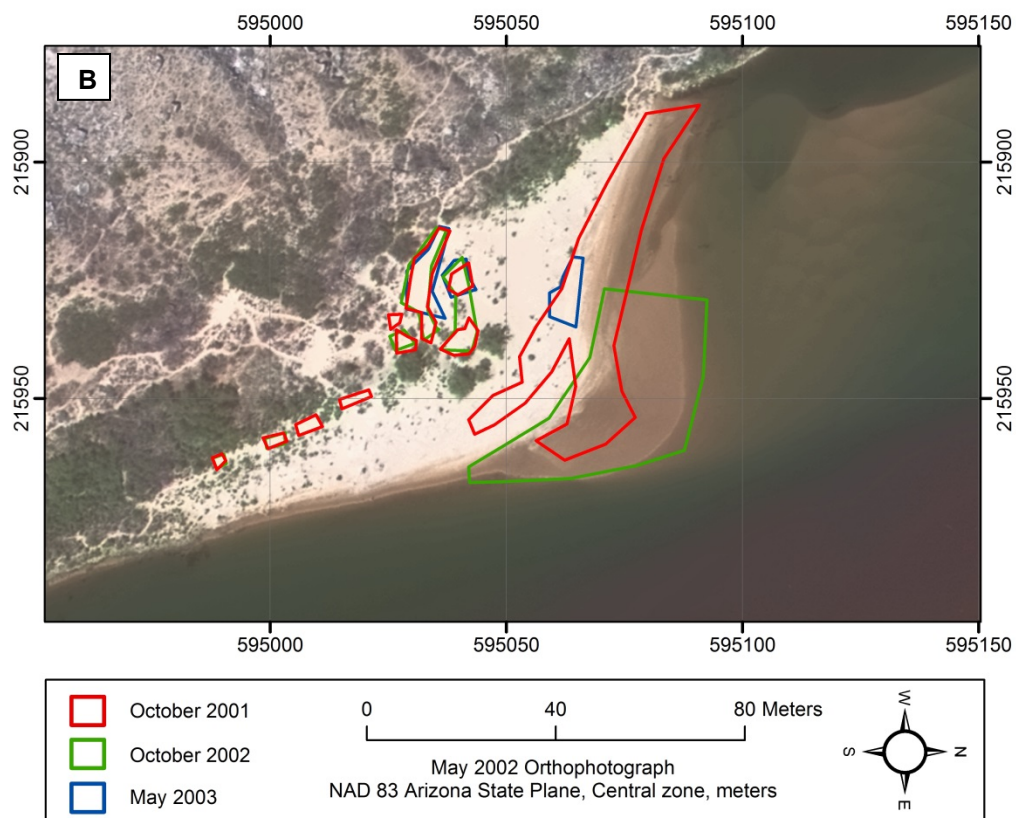
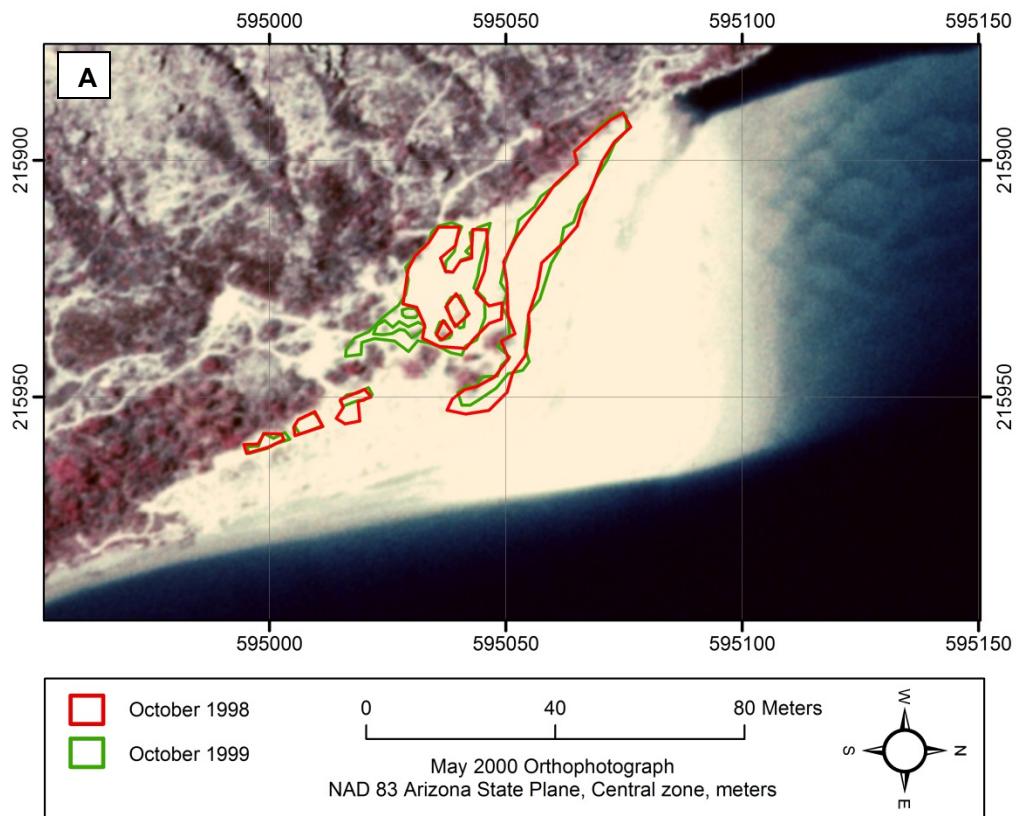
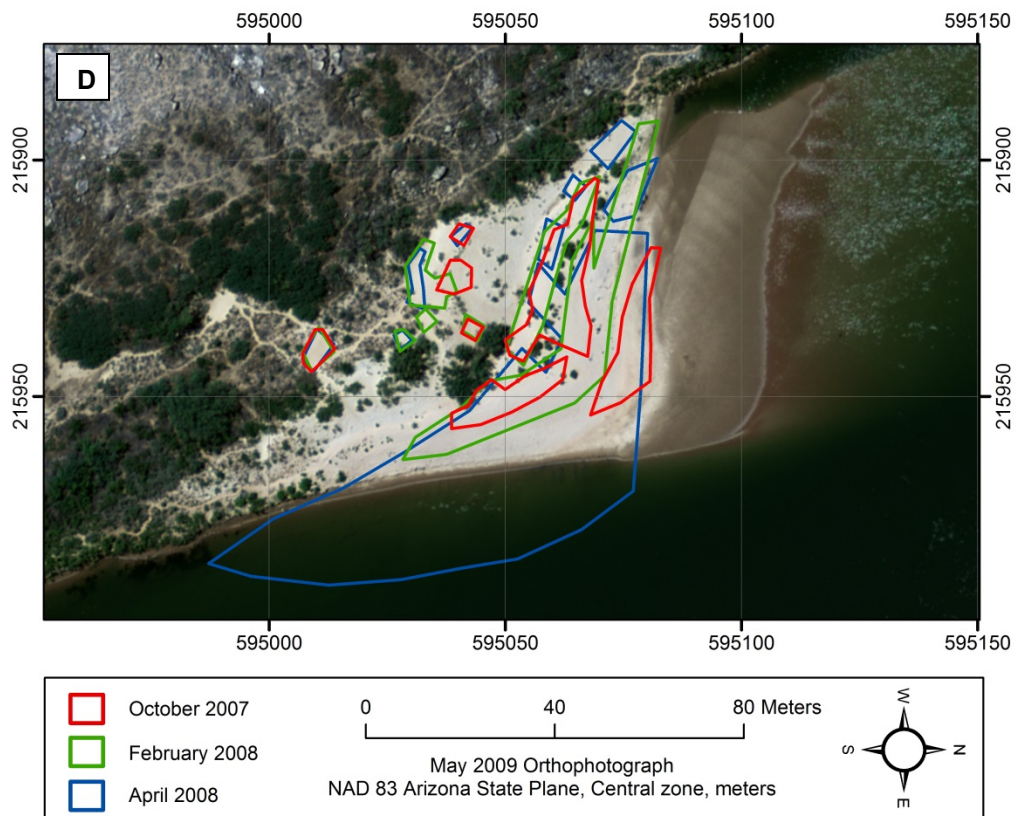
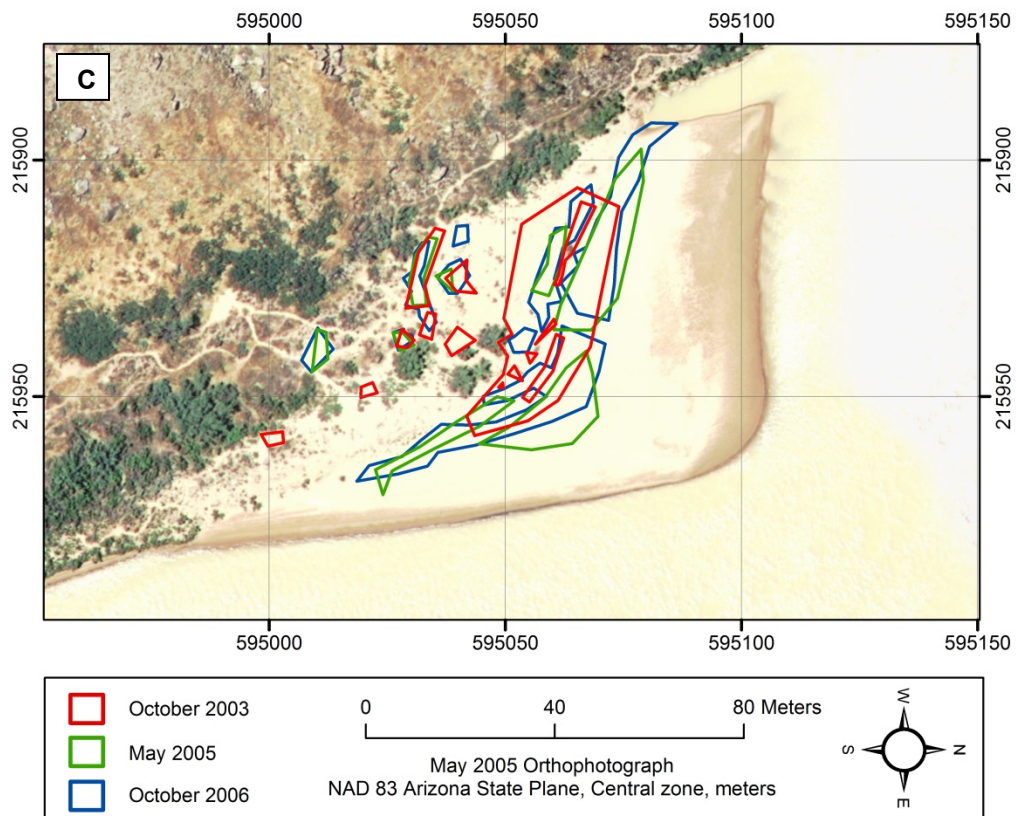


Figure A47. Time series plot showing campsite area at Lower Saddle camp (River Mile 47.6R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A13 for data.





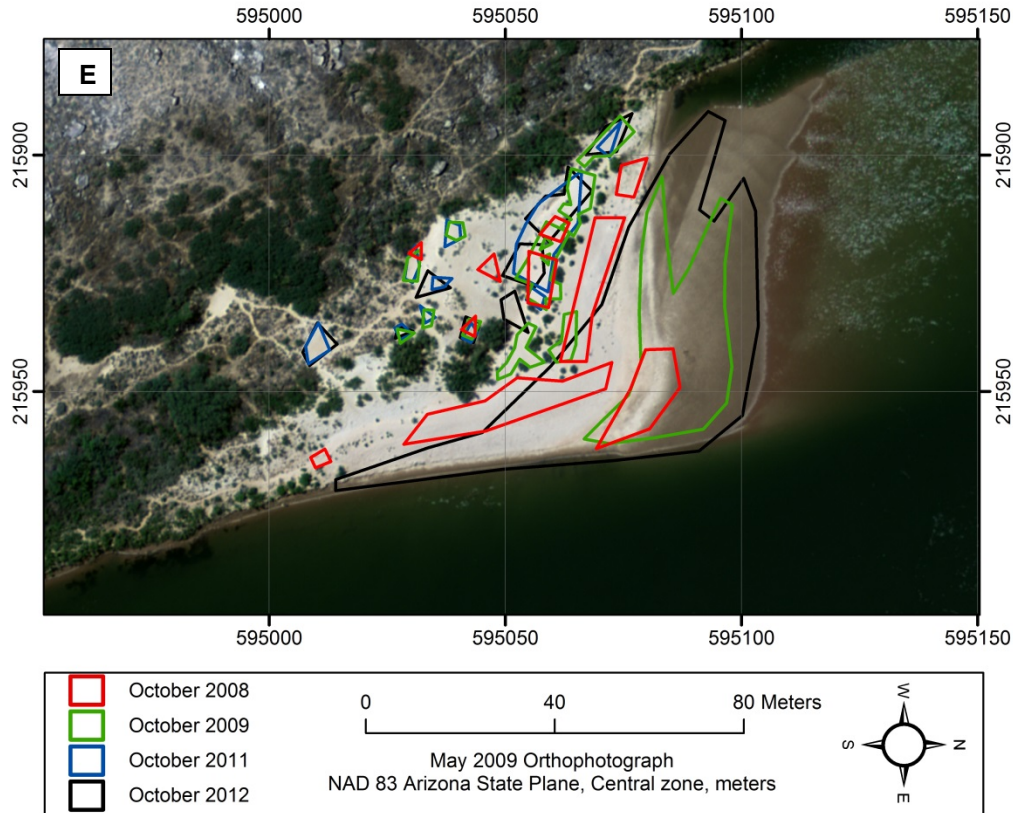


Figure A48. Maps showing campsite areas measured at Lower Saddle camp (River Mile 47.6R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A49. Remote camera photographs showing Lower Saddle camp located at River Mile 47.6R. (A) Photograph taken on October 14, 1998. Flow in main channel is from right to left; (B) Photograph taken on October 3, 2012. Flow in main channel is from left to right.

Campsite Name: Dinosaur

River Mile: 50.1, River Right

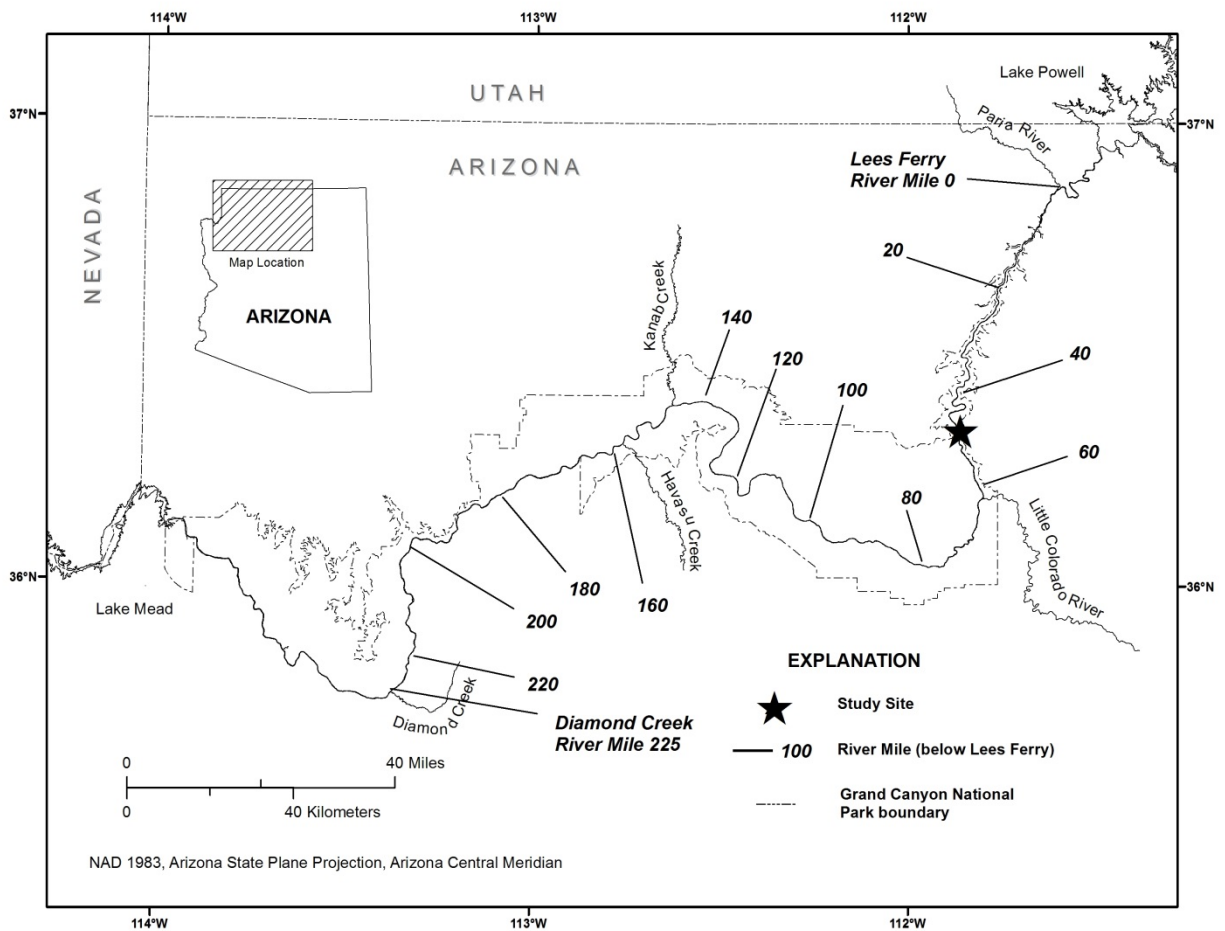


Figure A50. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Dinosaur camp study site (River Mile 50.1).

Table A14. Campsite area in different stage-elevation zones at Dinosaur camp (River Mile 50.1R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		15	66	30	388	283	81	702	783
10/8/1999		0	0	36	464	253	0	753	753
10/18/2000	0	1	90	183	306	266	91	755	846
10/8/2001	68	87	61	70	426	220	148	717	864
9/25/2002	31	119	0	2	484	280	119	766	885
4/30/2003	0	0	0	0	316	89	0	405	405
9/24/2003	0	0	0	11	314	181	0	506	506
5/11/2005	37	69	20	30	389	169	89	588	677
10/11/2006	30	183	0	0	233	105	183	338	521
10/17/2007	2	124	0	0	402	191	124	593	717
4/1/2008	0	0	0	20	475	116	0	611	611
10/15/2008	27	43	2	0	342	218	45	560	605
10/14/2009	85	62	3	0	387	81	66	467	533
10/9/2011		0	176	6	279	225	176	510	686
10/7/2012	32	84	54	18	288	204	138	510	648

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

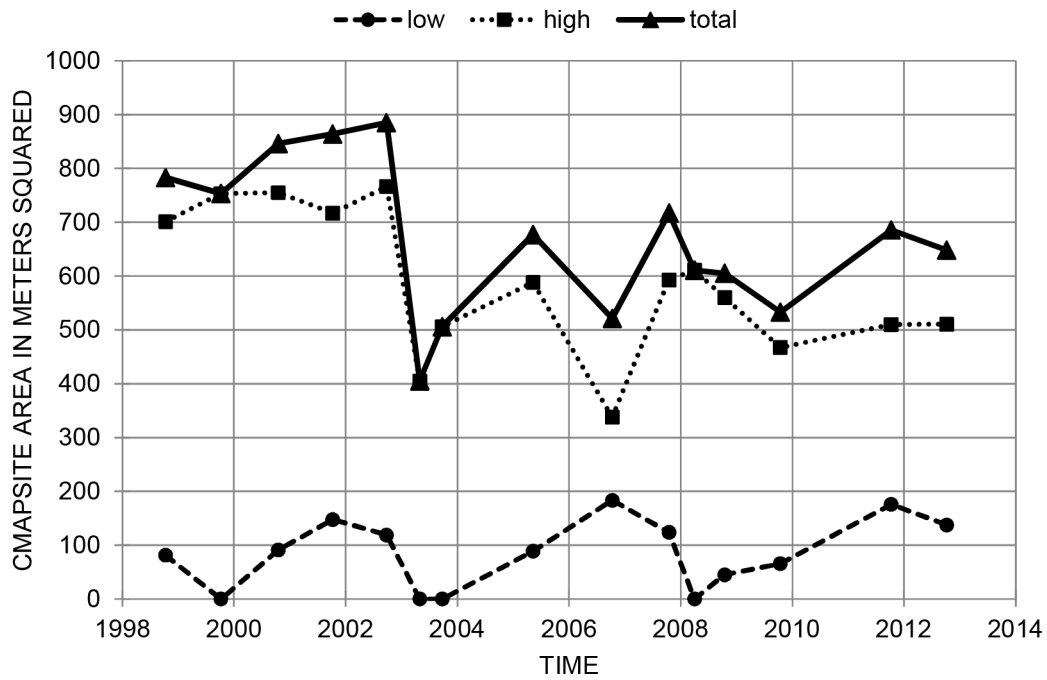
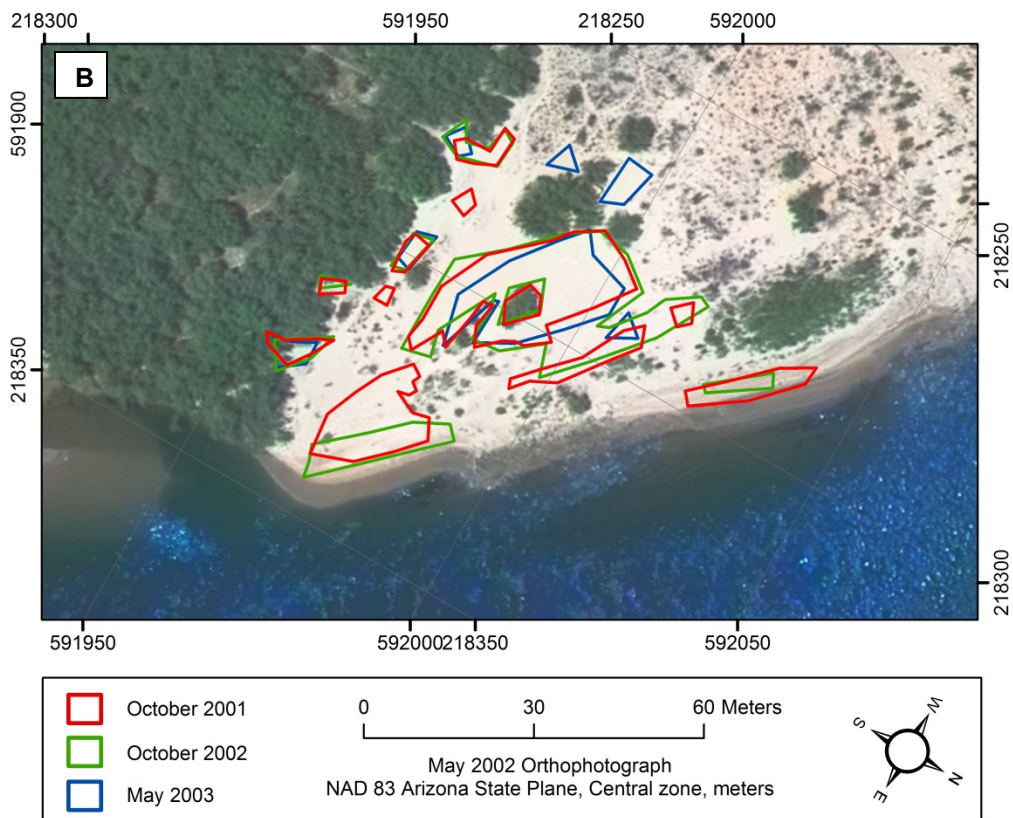
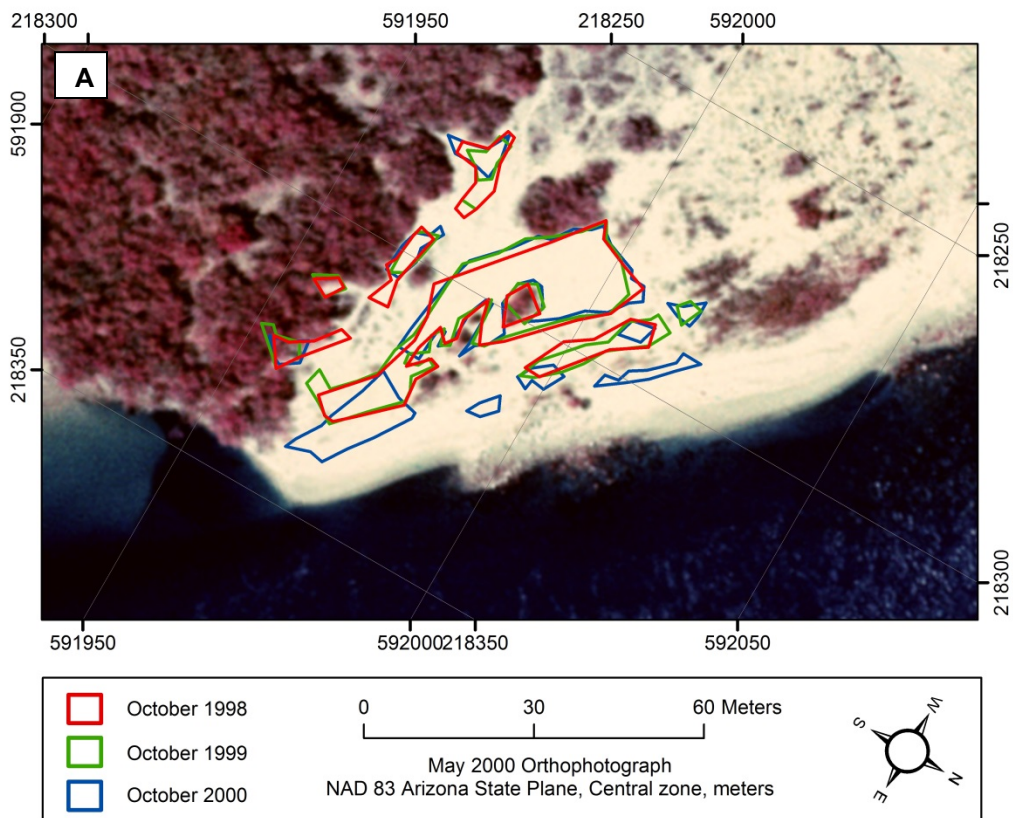
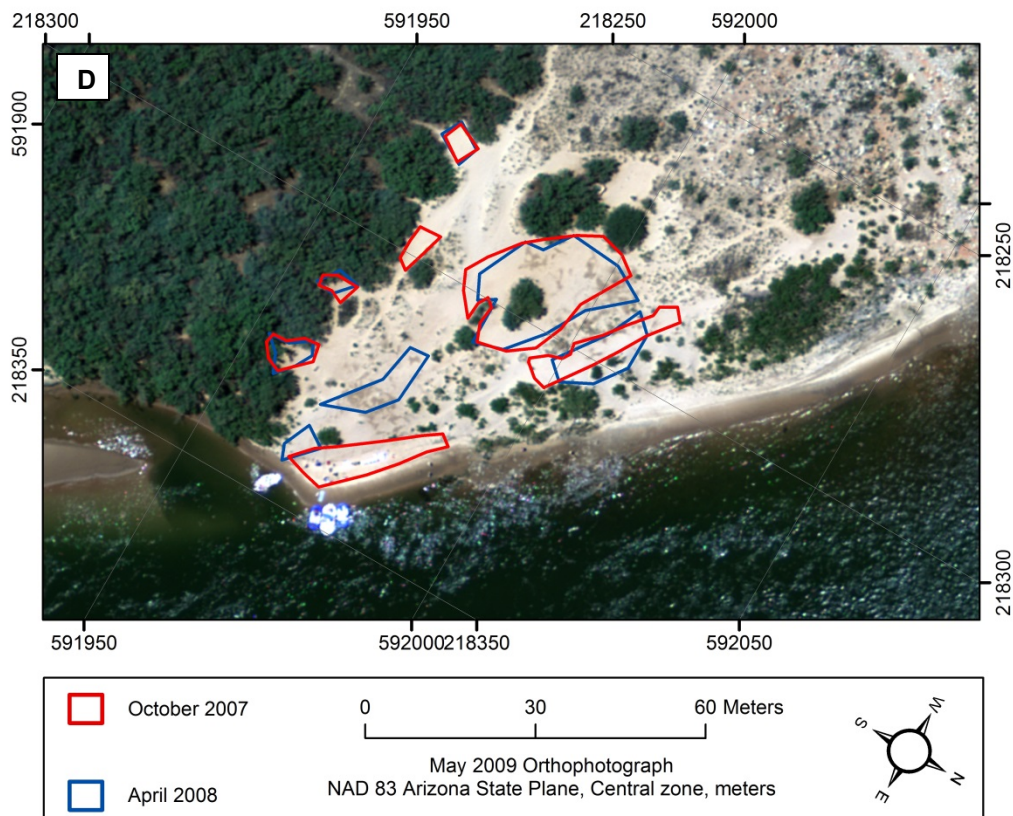
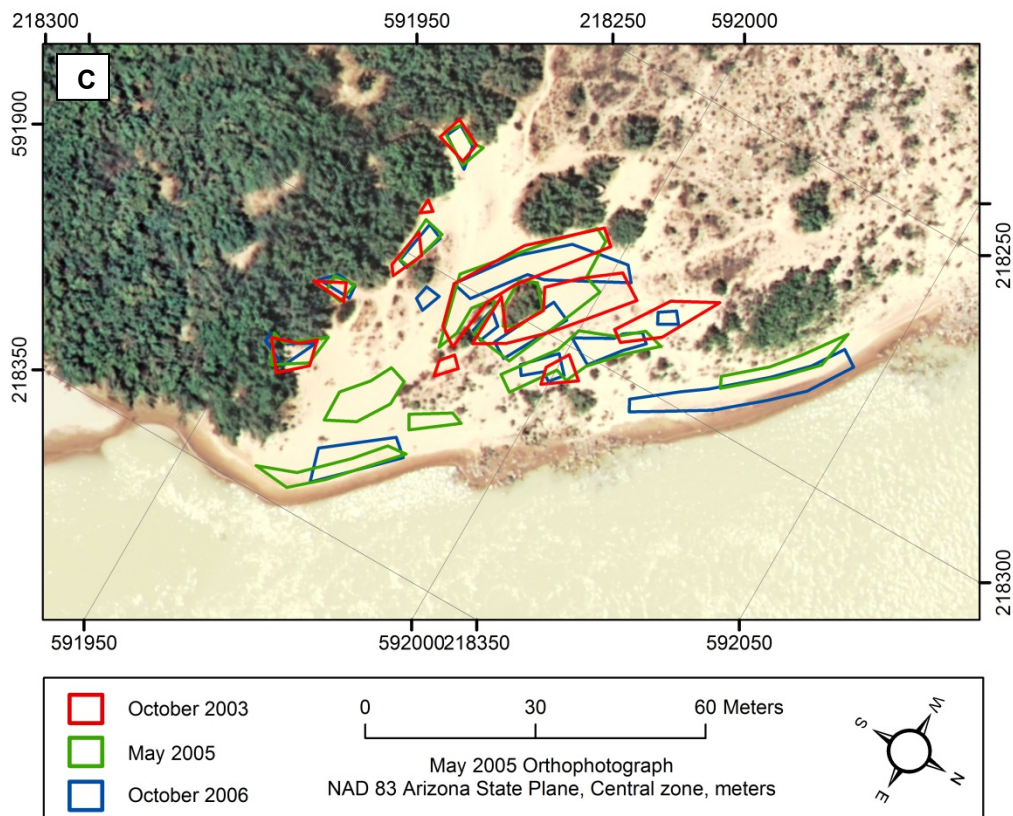


Figure A51. Time series plot showing campsite area at Dinosaur camp (River Mile 50.1R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A14 for data.





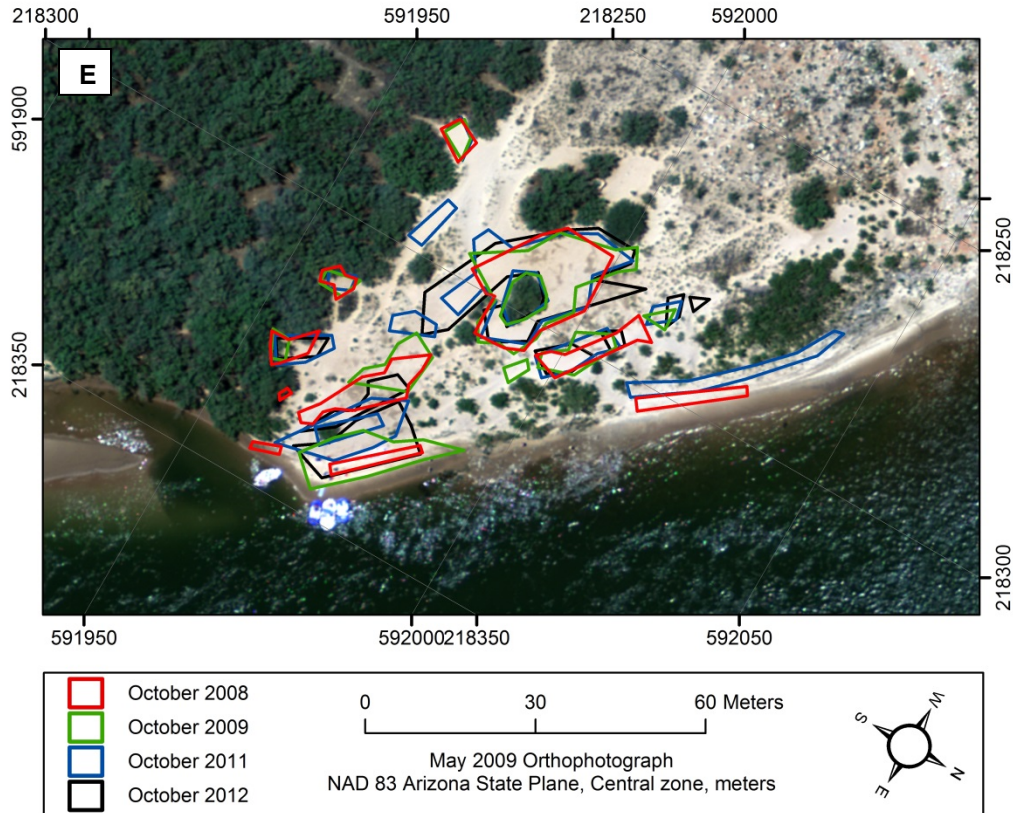


Figure A52. Maps showing campsite areas measured at Dinosaur camp (River Mile 50.1R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A53. Remote camera photographs showing of Dinosaur camp located at River Mile 50.1R. Flow in main channel is from right to left. (A) Photograph taken on July 7, 1998; (B) Photograph taken on October 11, 2012.

Campsite Name: 51 Mile

River Mile: 51.5, River Left

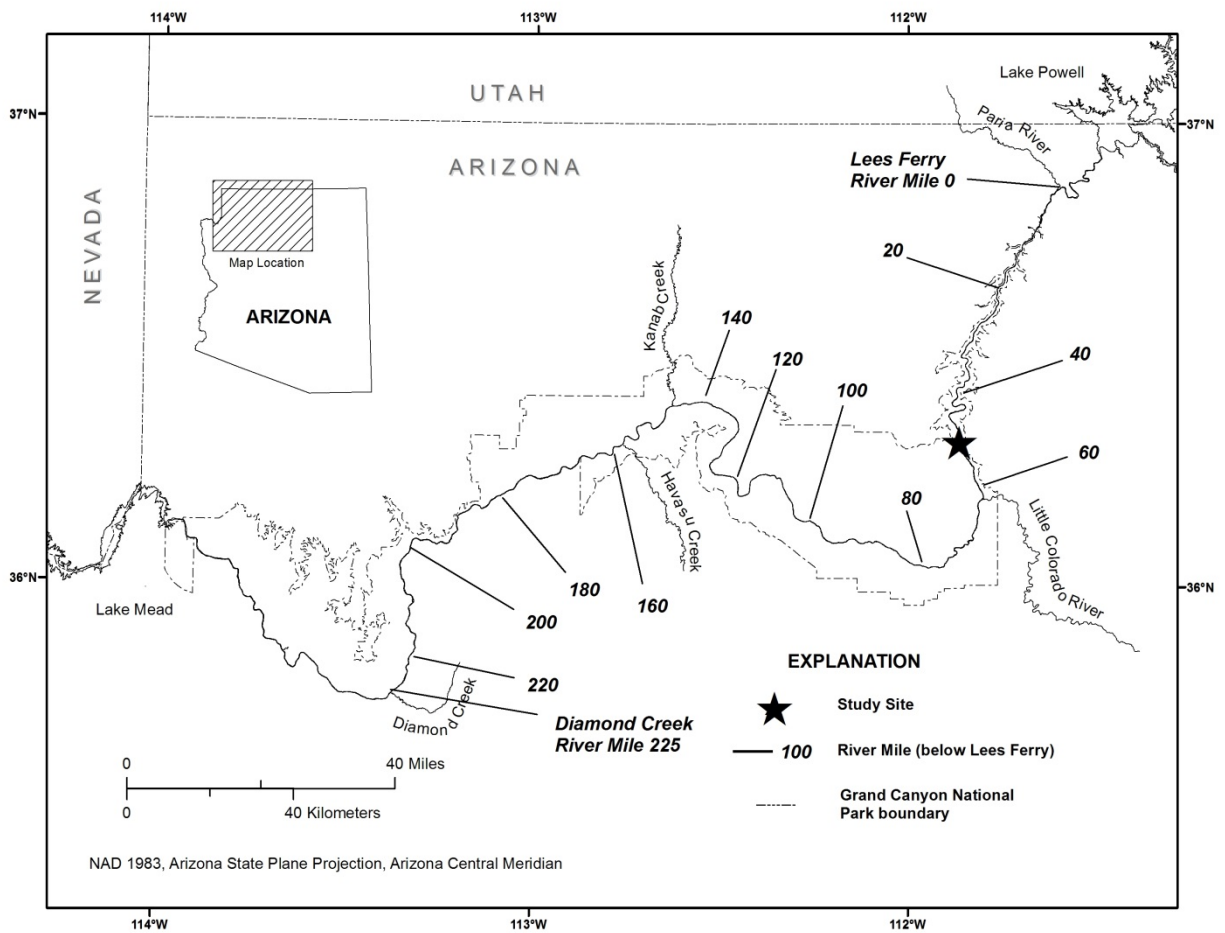


Figure A54. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 51 Mile camp study site (River Mile 51.5L).

Table A15. Campsite area in different stage-elevation zones at 51 Mile camp (River Mile 51.5L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998			102	0	1201	76	102	1277	1379
10/8/1999			6	13	630	9	6	653	658
10/18/2000	1	1026	541	96	439	9	1567	544	2111
10/9/2001	498	1445	416	100	167	0	1861	267	2128
9/25/2002	49	147	0	0	414	6	147	420	567
5/1/2003	1	755	133	64	292	0	889	357	1245
9/25/2003	317	0	28	28	192	7	28	228	255
5/12/2005	0	99	0	9	147	0	99	156	255
10/12/2006	0	0	0	0	147	0	0	147	147
10/18/2007	25	17	0	0	92	3	17	95	112
2/8/2008	0	0	0	0	109	0	0	109	109
4/2/2008	0	0	0	0	161	0	0	161	161
10/16/2008	0	0	0	0	98	0	0	98	98
10/14/2009	209	0	0	0	77	6	0	83	83
10/10/2011		0	0	0	63	8	0	70	70
10/8/2012	1424	41	0	0	35	0	41	35	76

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

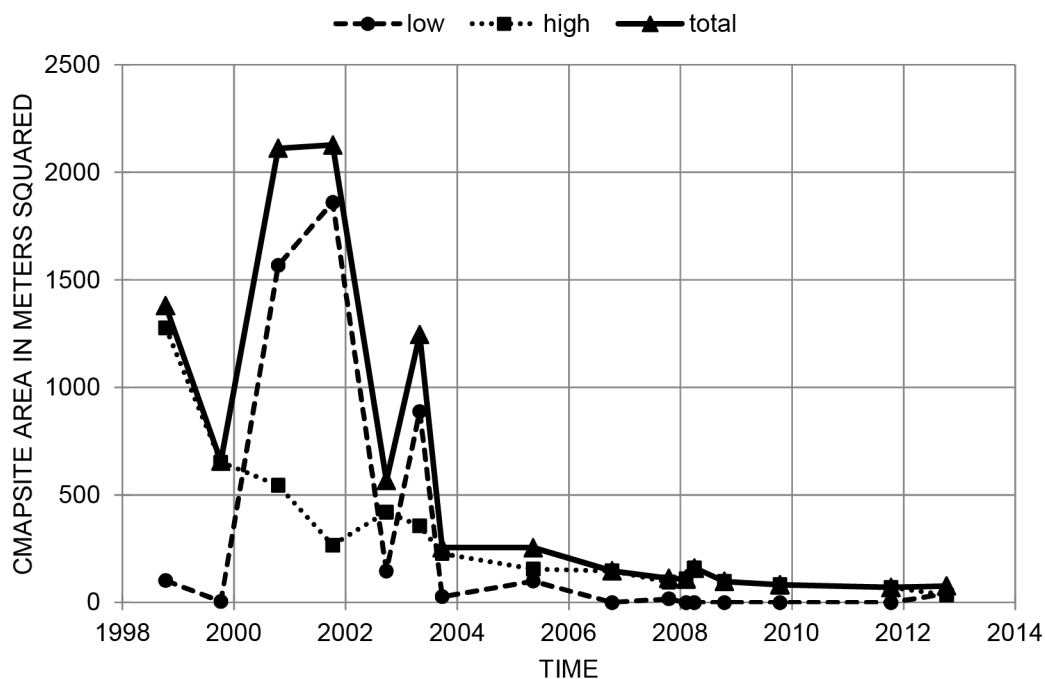
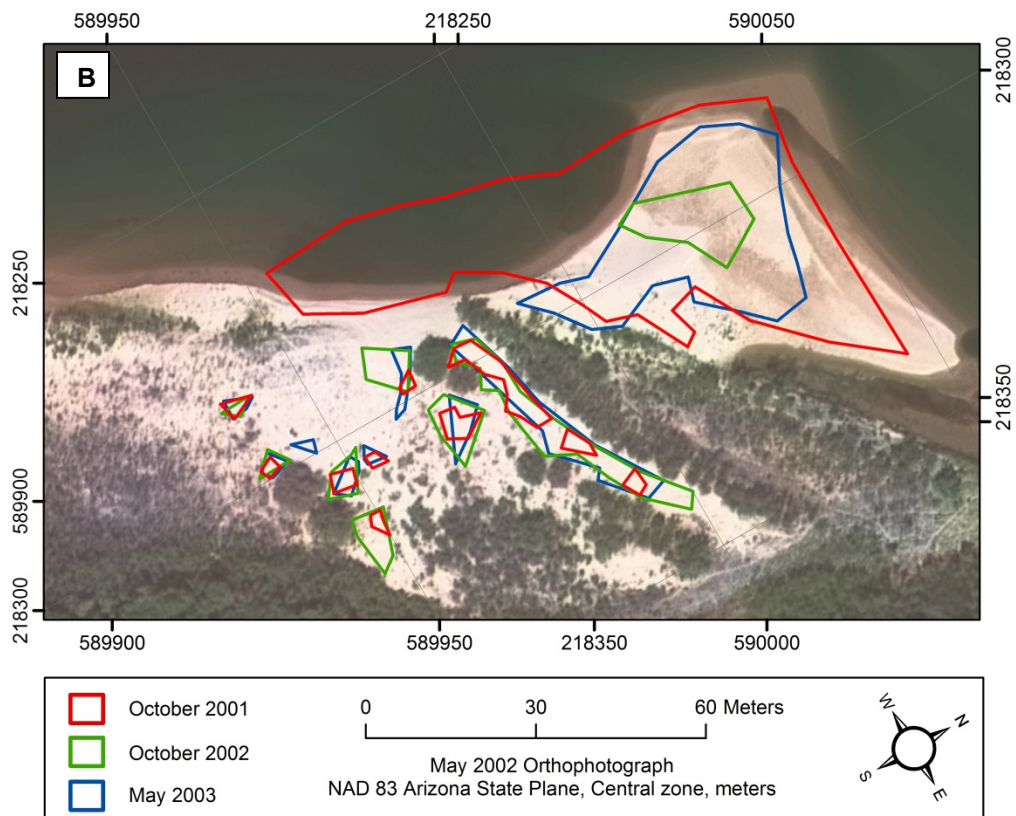
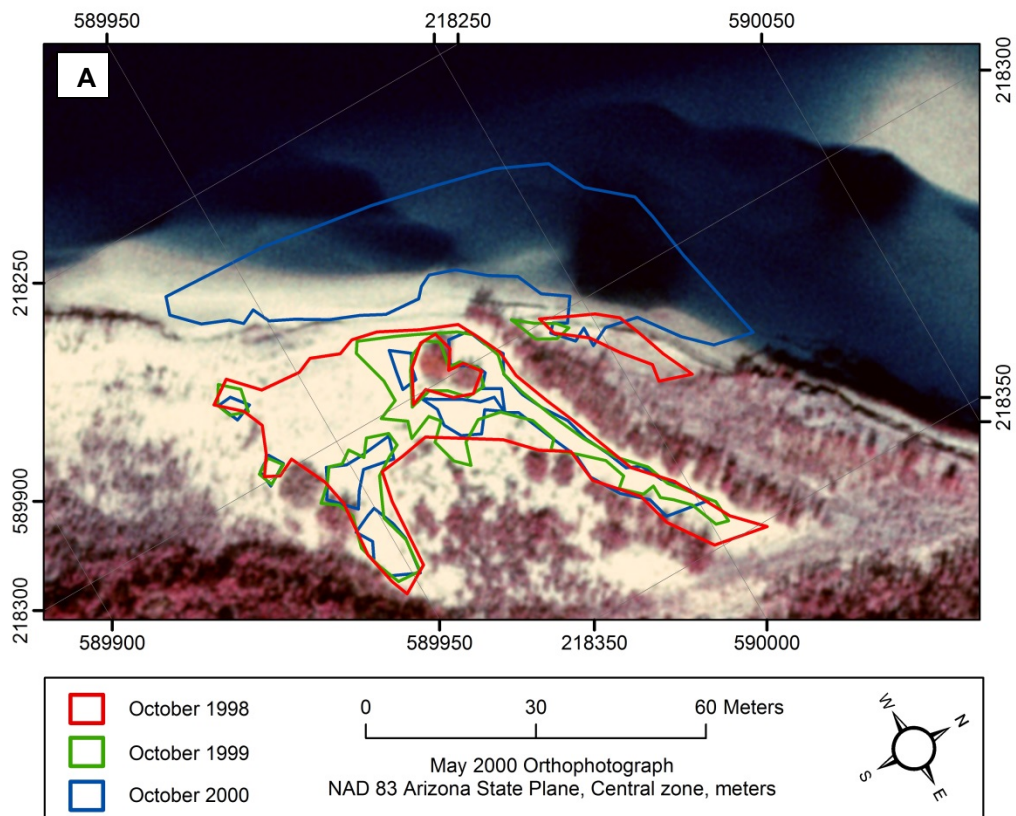
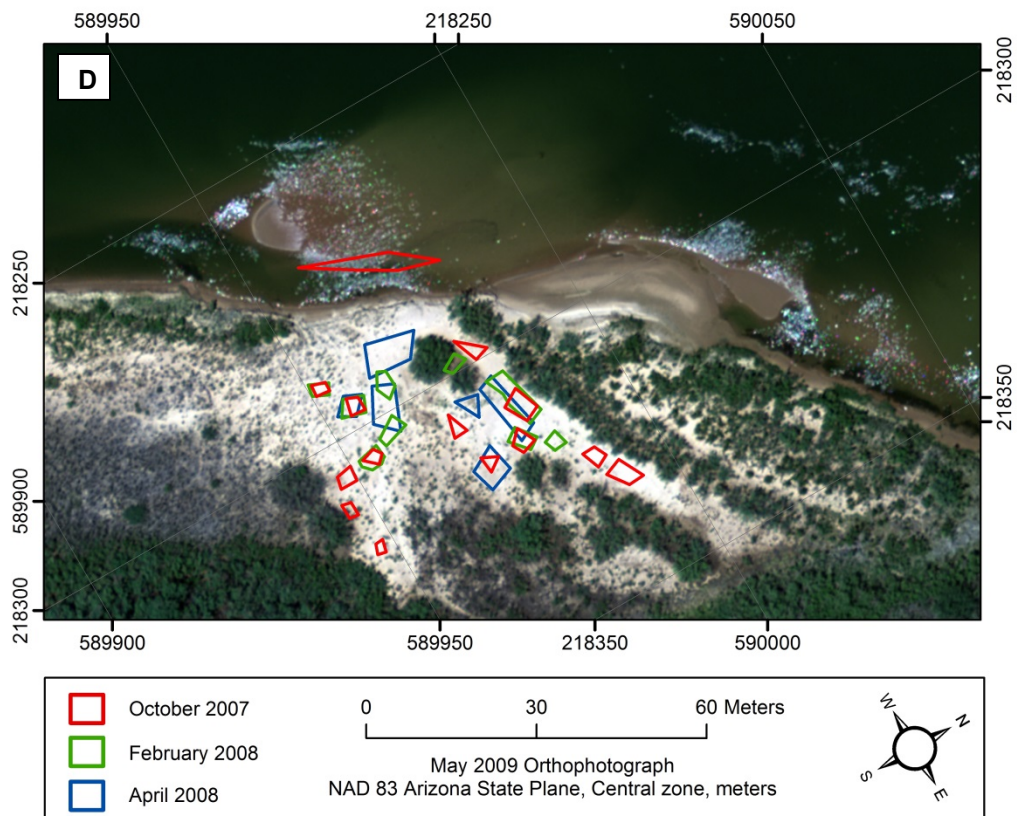
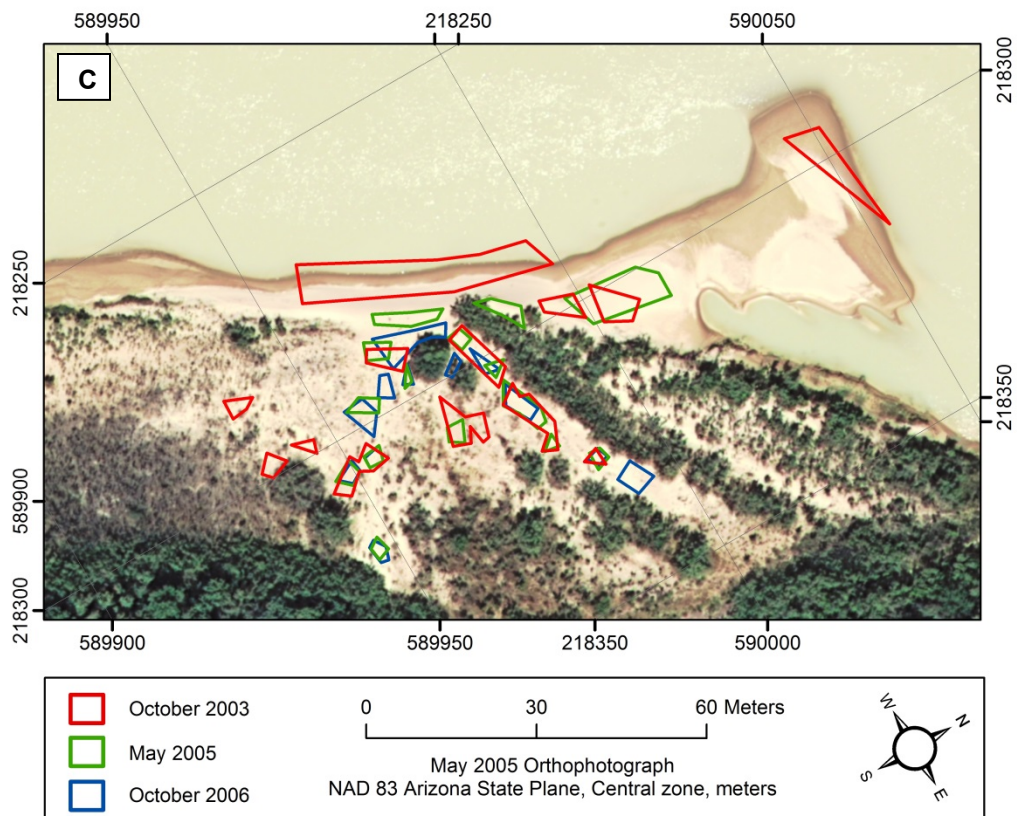


Figure A55. Time series plot showing campsite area at 51 Mile camp (River Mile 51.5L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A15 for data.





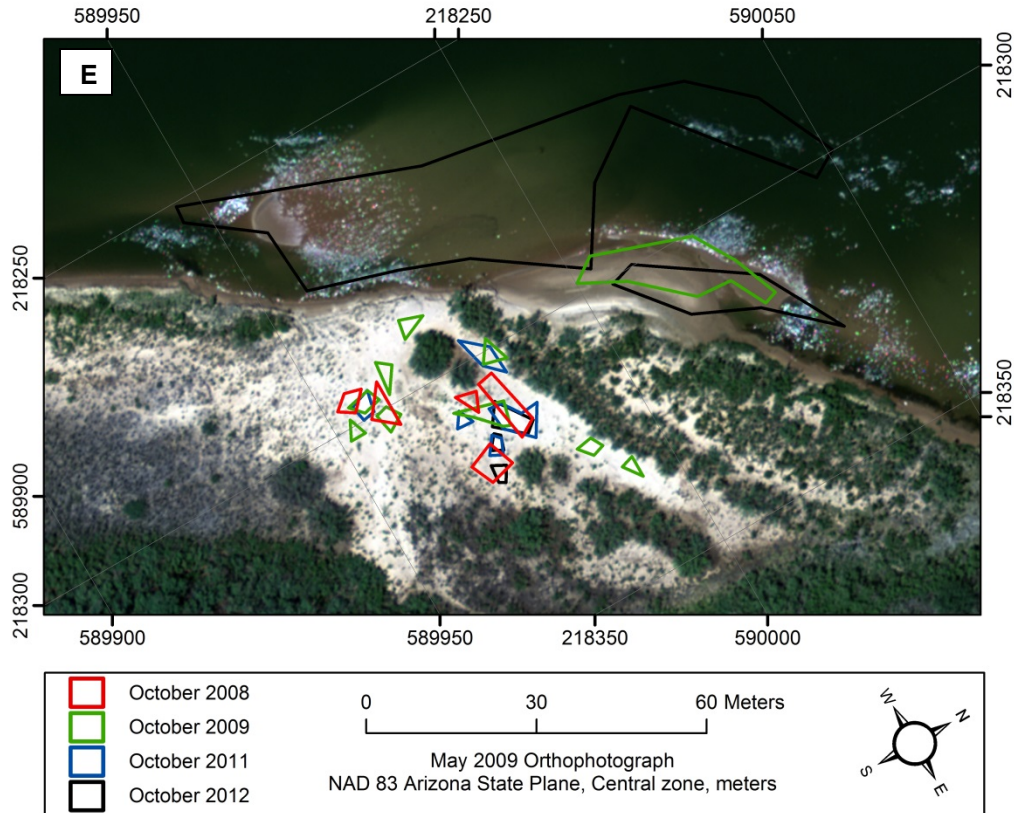


Figure A56. Maps showing campsite areas measured at 51 Mile camp (River Mile 51.5L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A57. Remote camera photograph showing 51 Mile camp at River Mile 51.5L. Flow in main channel is from left to right. Photograph taken on October 8, 2012.

Campsite Name: Kwagunt Marsh

River Mile: 55.9, River Right

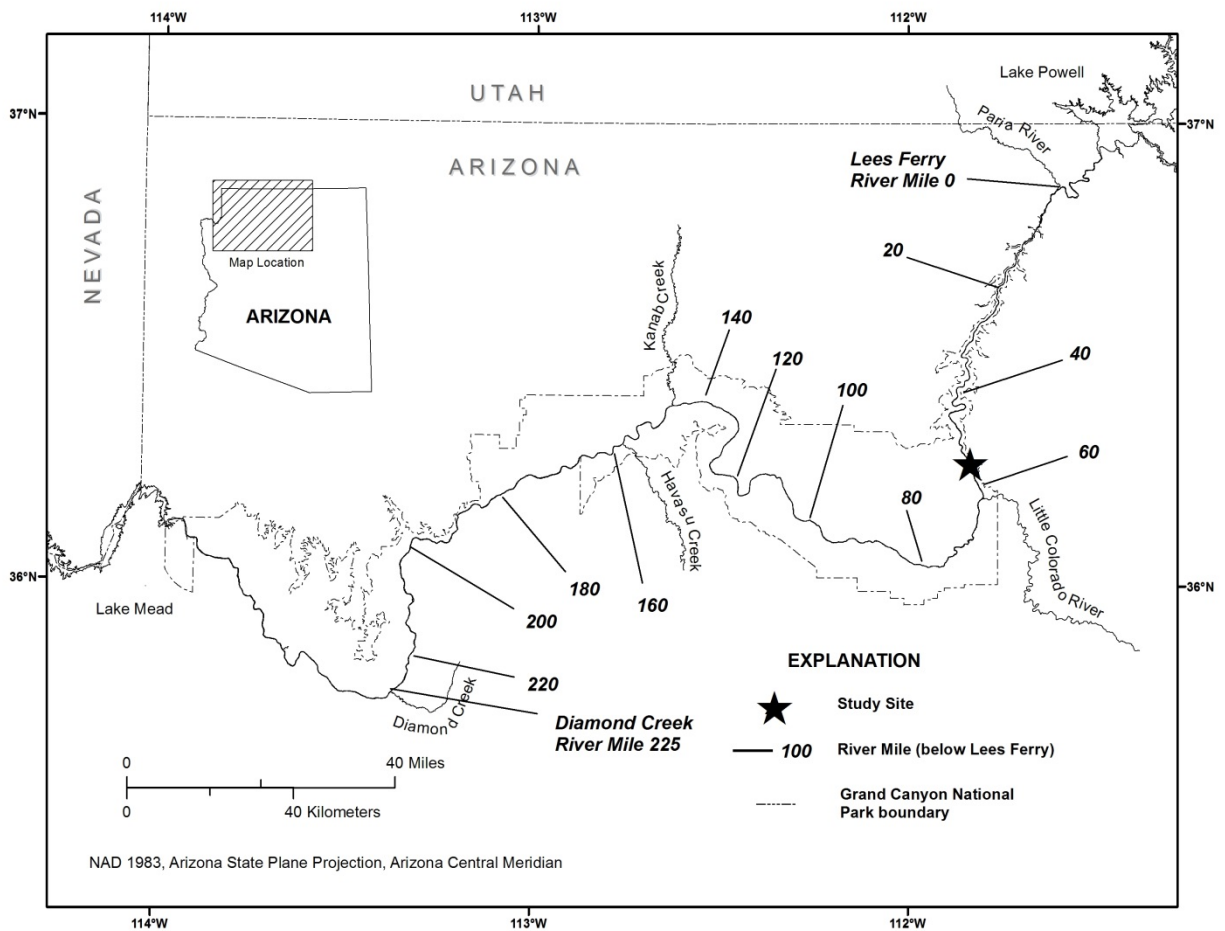


Figure A58. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Kwagunt Marsh camp study site (River Mile 55.9R).

Table A16. Campsite area in different stage-elevation zones at Kwagunt Marsh camp (River Mile 55.9R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	6	479	63	0	548	548
10/8/1999		0	0	1	298	125	0	424	424
10/18/2000		0	0	0	232	41	0	273	273
10/9/2001	0	0	0	0	167	28	0	195	195
9/25/2002	0	0	0	3	107	16	0	126	126
5/1/2003	0	0	0	1	70	7	0	78	78
9/25/2003	0	0	0	1	29	0	0	30	30
5/12/2005	0	0	0	1	118	0	0	119	119
10/12/2006	0	0	0	0	0	0	0	0	0
10/18/2007	0	0	0	0	0	0	0	0	0
2/8/2008	0	0	0	0	0	0	0	0	0
4/2/2008	0	87	0	0	14	6	87	20	107
10/16/2008	0	0	0	0	0	0	0	0	0
10/15/2009	891	11	0	0	5	7	11	12	23
10/10/2011		0	0	0	0	0	0	0	0
10/8/2012	0	0	0	0	0	0	0	0	0

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

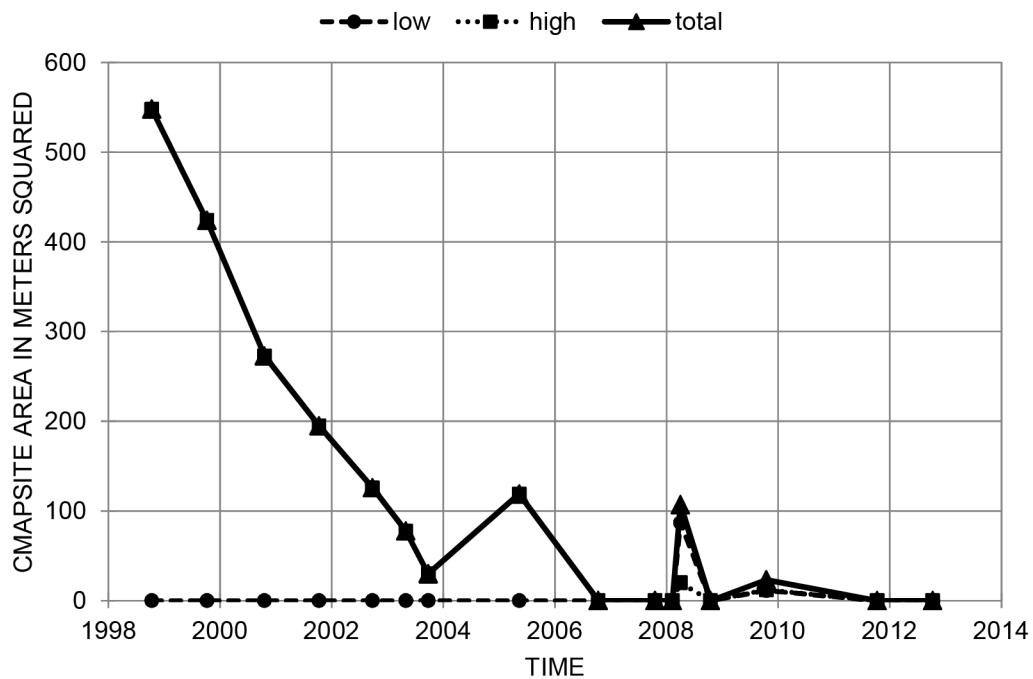
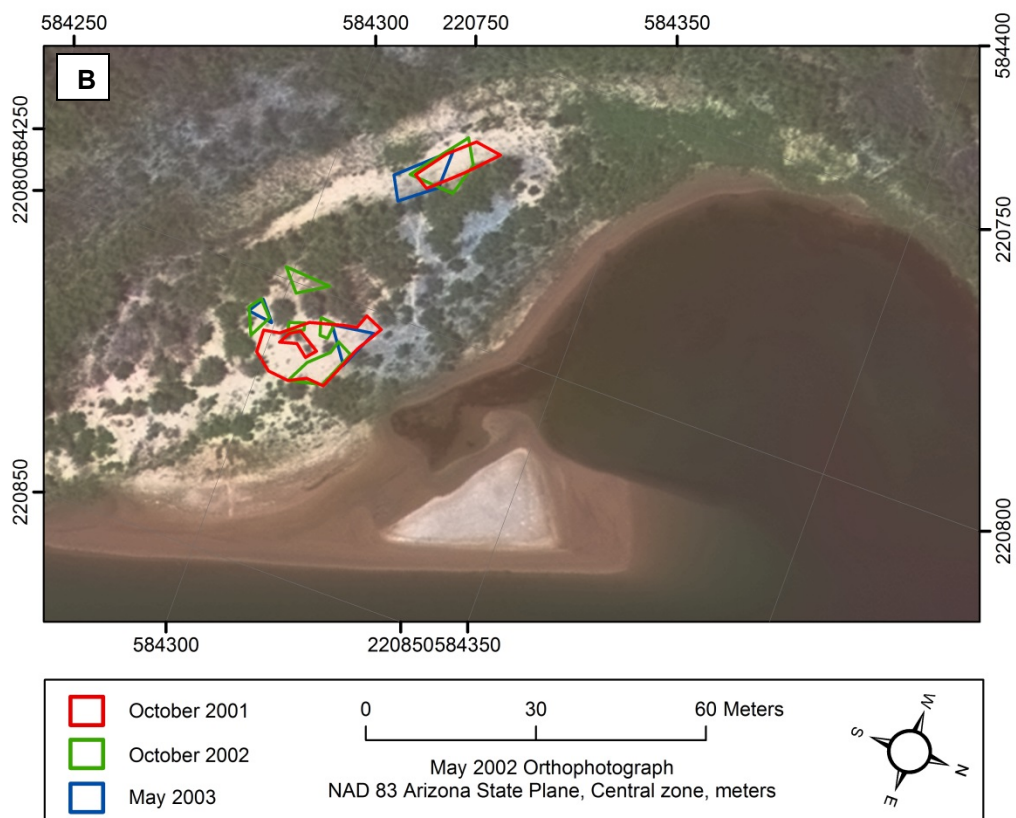
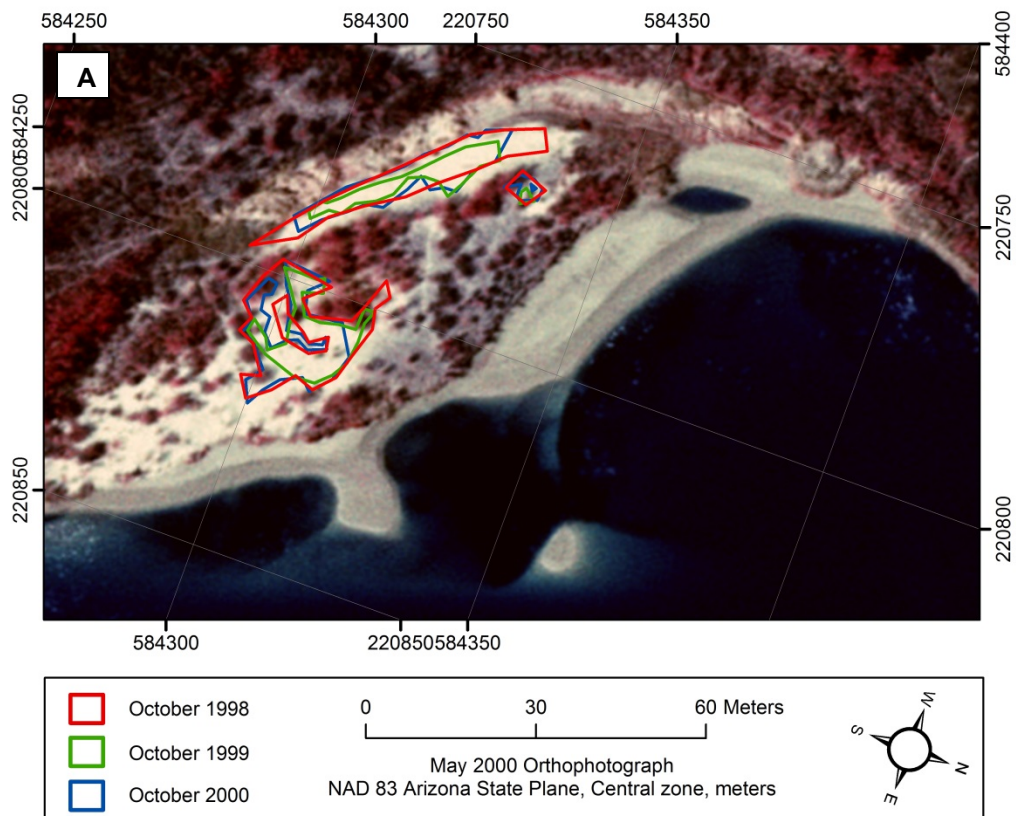
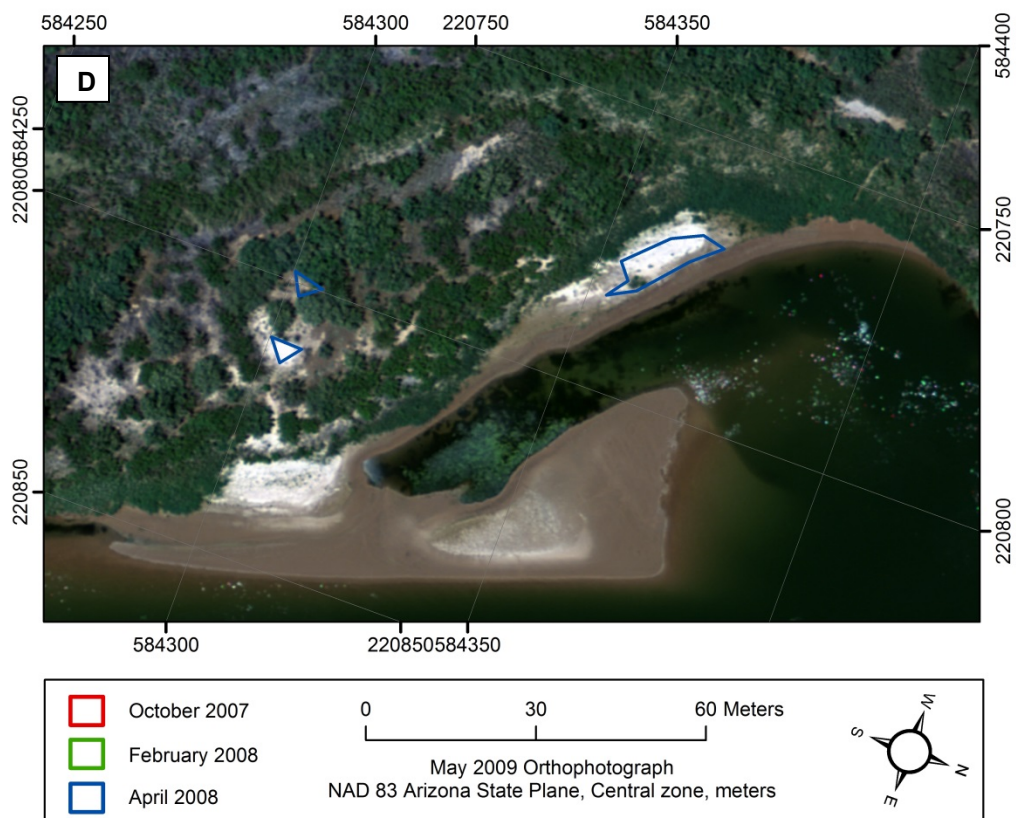
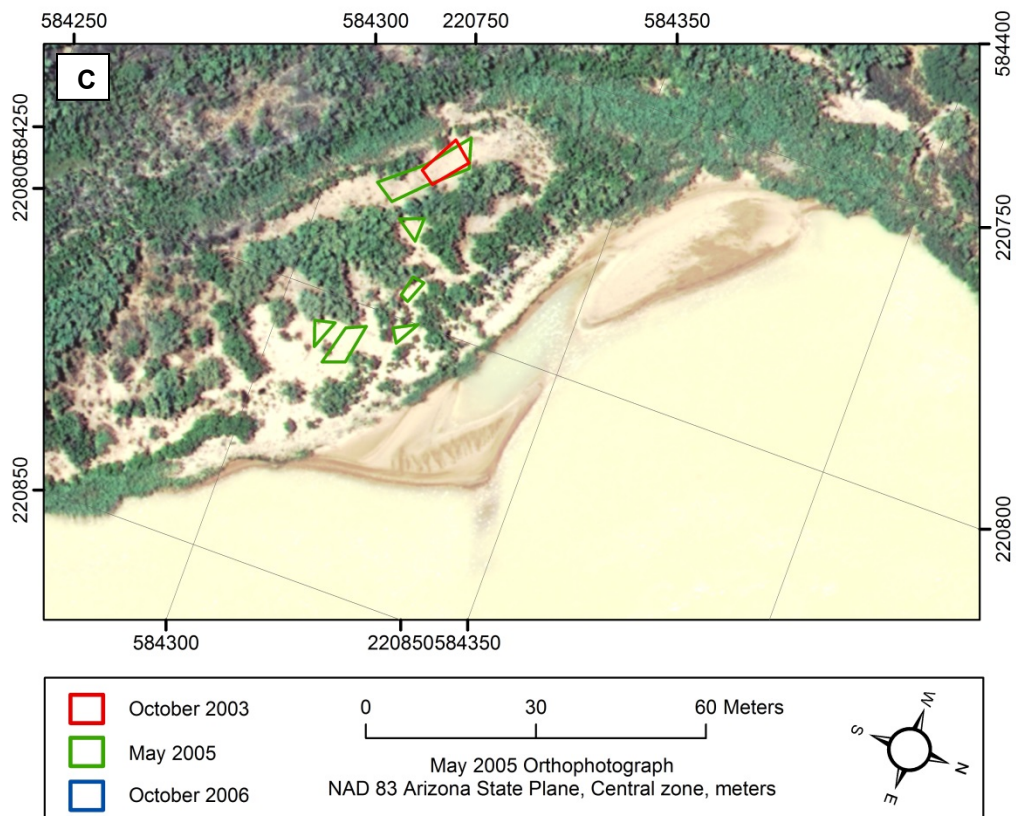


Figure A59. Time series plot showing campsite area at Kwagunt Marsh camp (River Mile 55.9R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A16 for data.





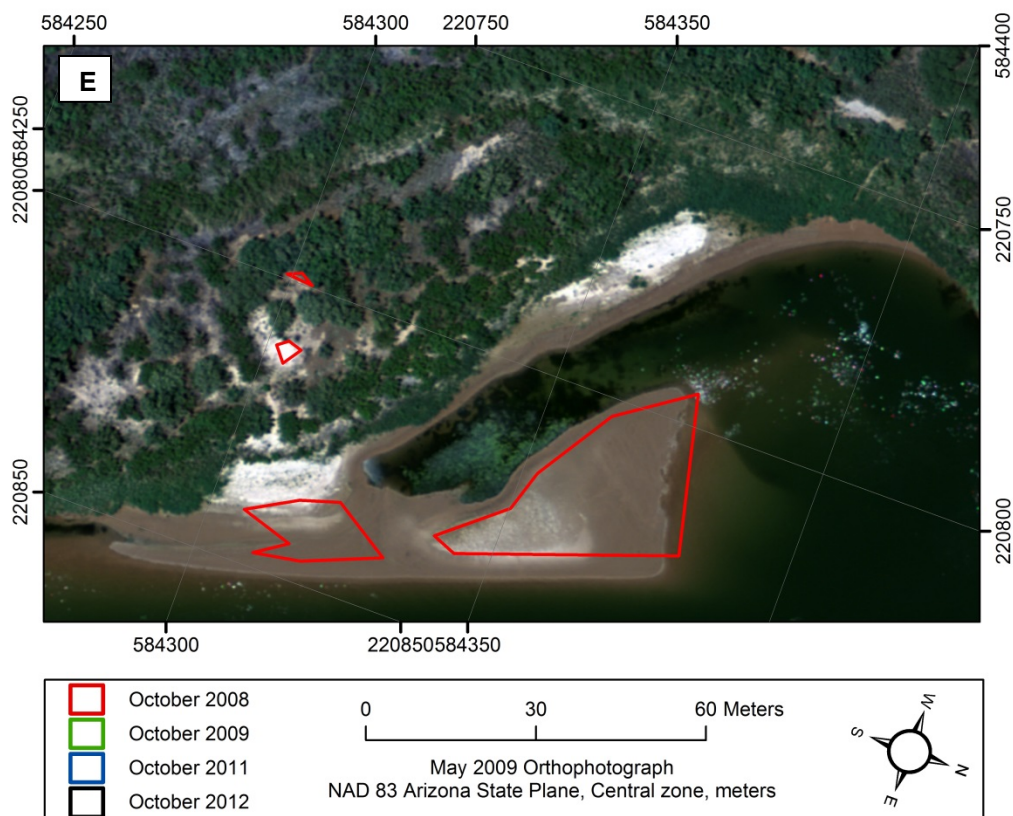


Figure A60. Maps showing campsite areas measured at Kwagunt Marsh camp (River Mile 55.9R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A61. Remote-camera photographs showing Kwagunt Marsh camp at River Mile 55.9R. Flow in main channel is from right to left. (A) Photograph taken on October 7, 1998; (B) Photograph taken on October 9, 2012.

Campsite Name: Crash

River Mile: 62.9, River Right

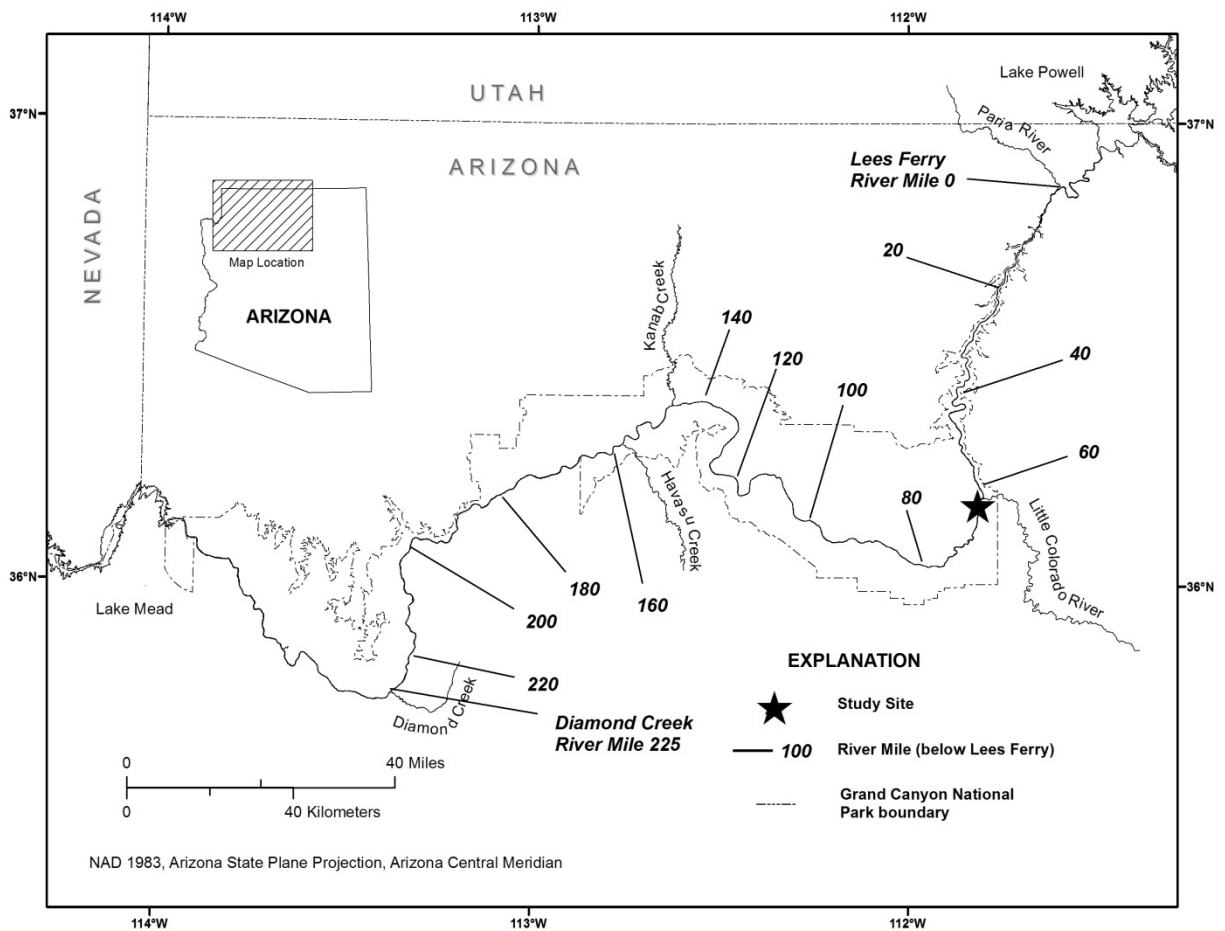


Figure A62. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Crash camp study site (River Mile 62.9R).

Table A17. Campsite area in different stage-elevation zones at Crash camp (River Mile 62.9R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	0	166	21	0	187	187
10/8/1999		0	0	3	18	0	0	21	21
10/19/2000		1	45	41	127	13	46	181	227
10/9/2001	13	42	0	4	64	9	42	77	119
9/27/2002	22	4	0	6	21	4	4	31	35
5/2/2003	12	89	14	3	12	10	103	25	128
9/27/2003	27	68	2	25	11	10	70	46	116
5/13/2005	28	14	0	102	55	0	14	157	171
10/13/2006	0	0	0	1	26	5	0	32	32
10/19/2007	0	0	0	0	23	7	0	30	30
2/10/2008	0	0	0	0	24	7	0	31	31
4/3/2008	0	0	0	0	130	5	0	135	135
10/17/2008	6	40	0	1	124	7	40	132	172
10/16/2009	29	29	0	0	54	8	29	62	91
10/11/2011		1	28	20	33	8	30	61	90
10/9/2012	0	3	23	18	31	8	26	58	84

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

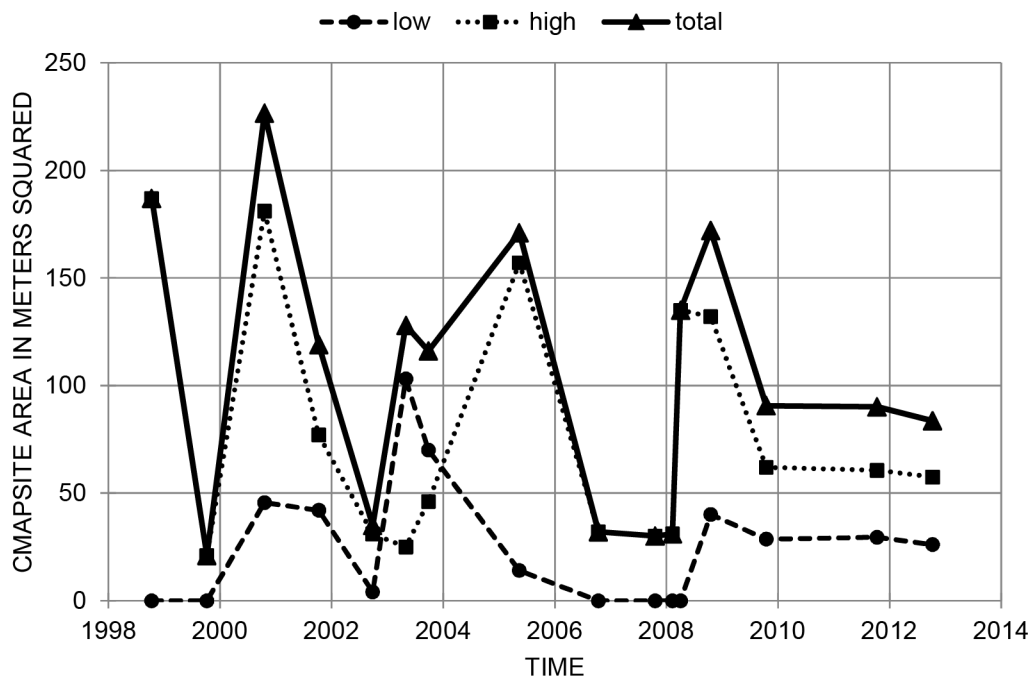
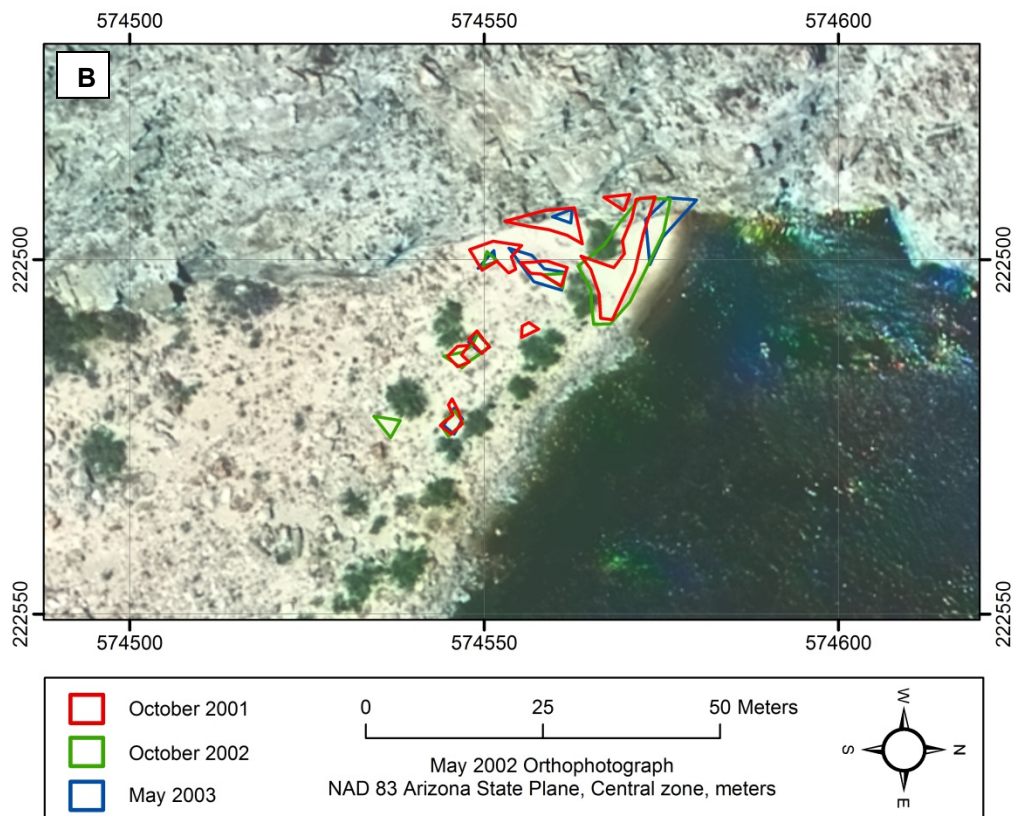
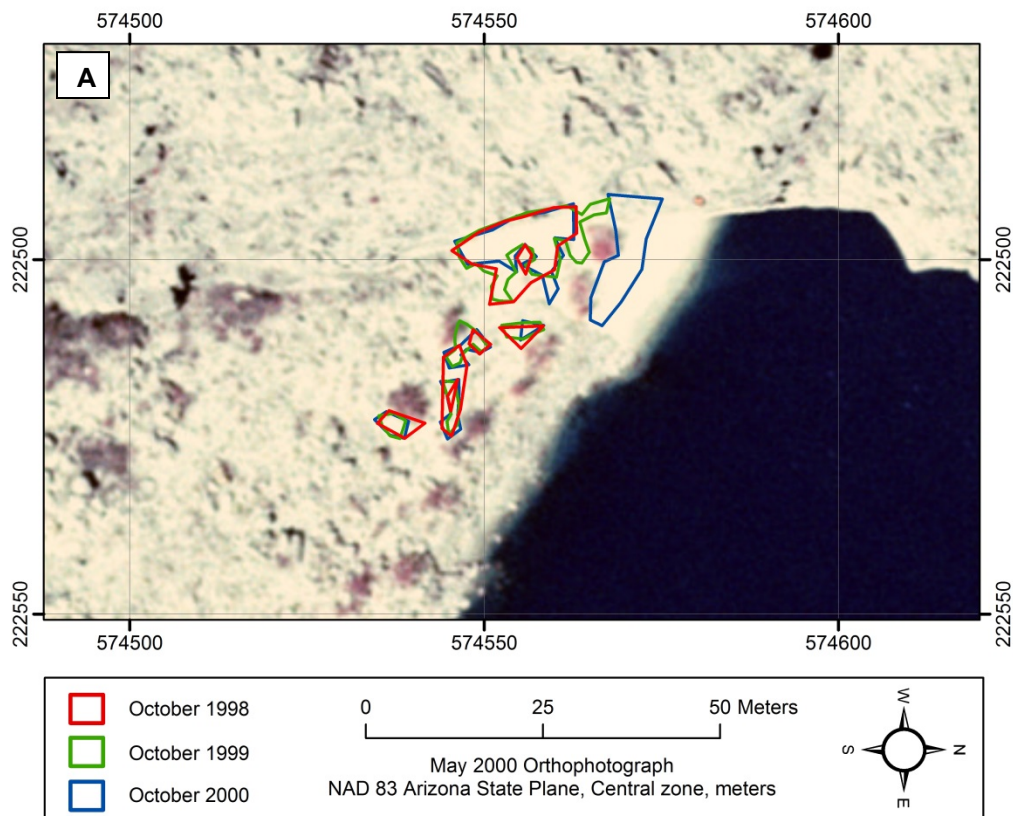
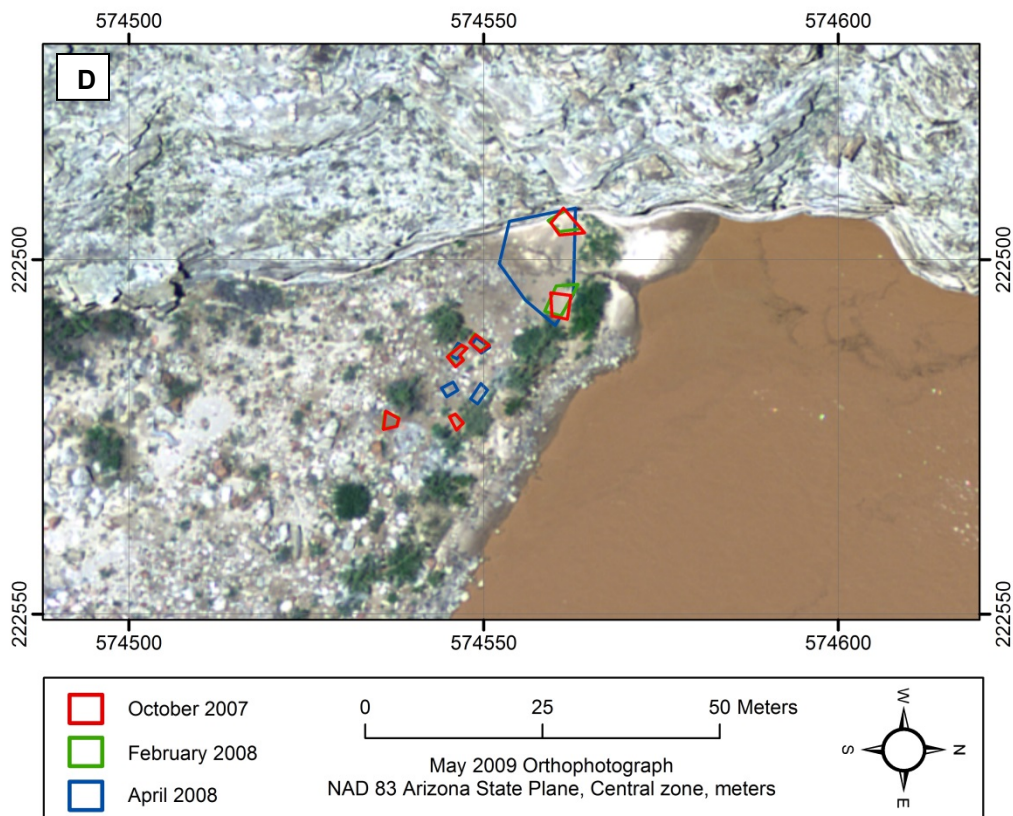
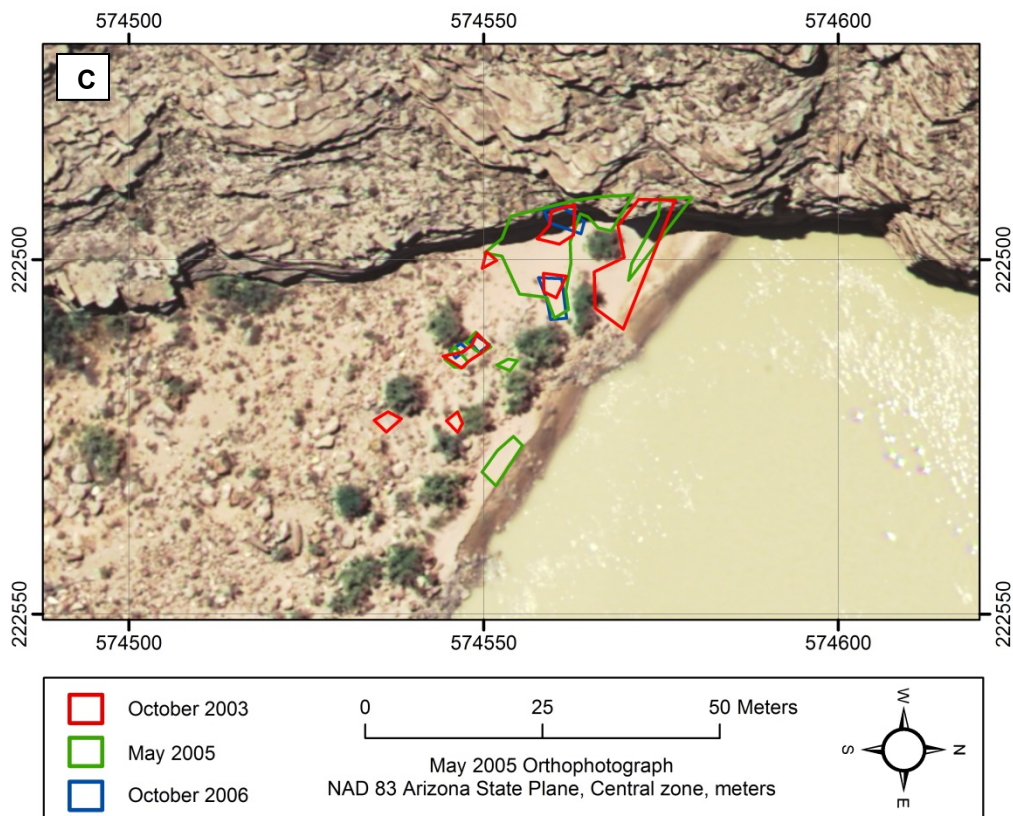


Figure A63. Time series plot showing campsite area at Crash camp (River Mile 62.9R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A17 for data.





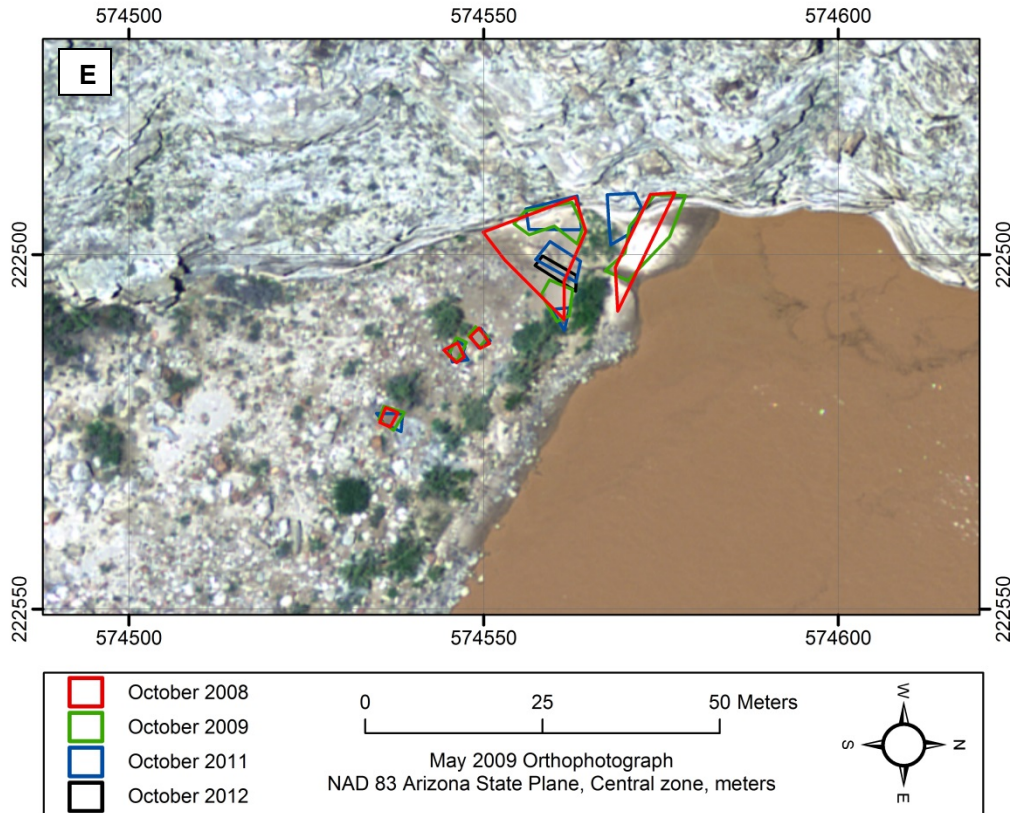


Figure A64. Maps showing campsite areas measured at Crash camp (River Mile 62.9R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.

Campsite Name: Grapevine
River Mile: 81.7, River Left

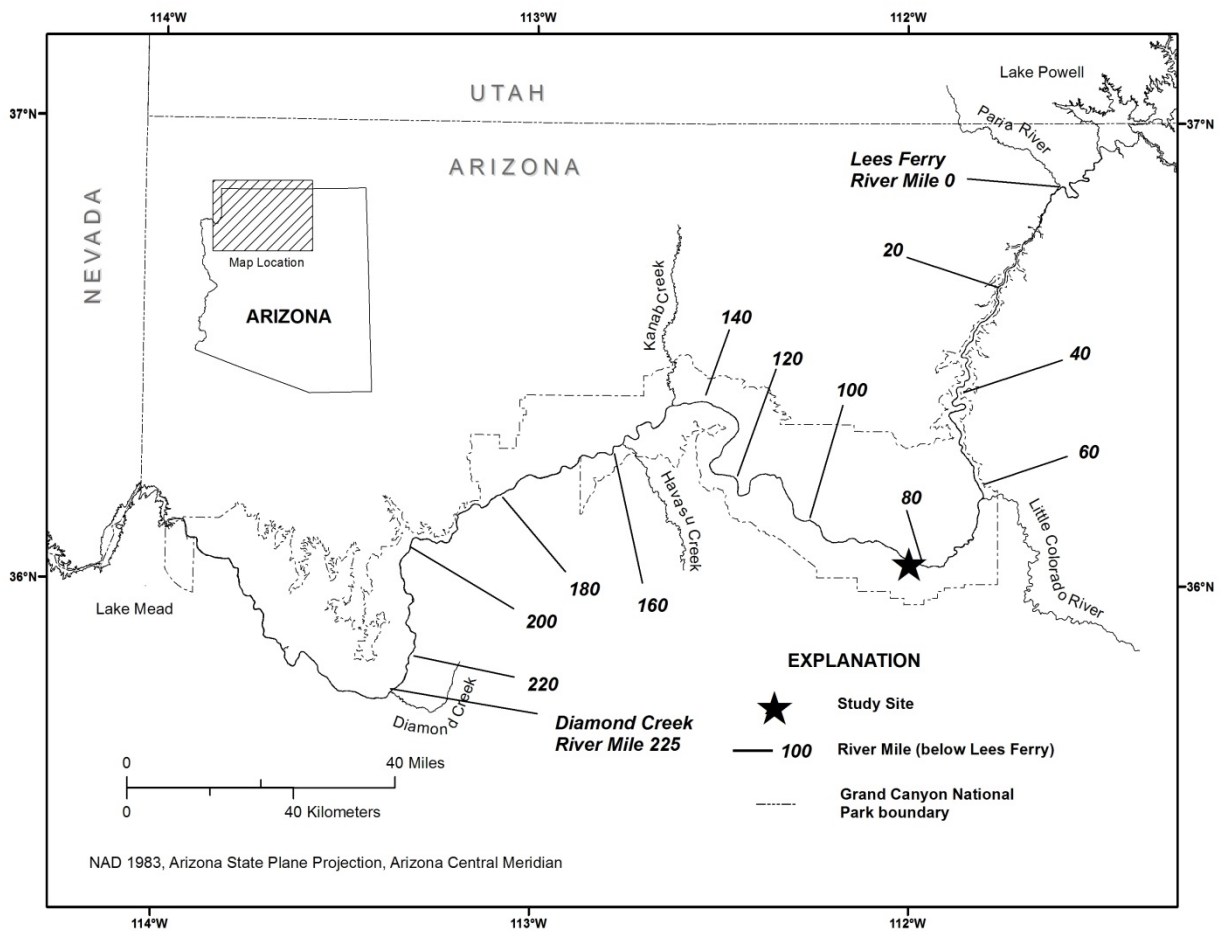


Figure A65. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Grapevine camp study site (River Mile 81.7L).

Table A18. Campsite area in different stage-elevation zones at Grapevine camp (River Mile 81.7L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/15/1998		0	0	84	1056	27	0	1167	1167
10/8/1999		0	15	97	1001	31	15	1129	1144
10/20/2000	0	0	188	291	844	28	188	1163	1351
10/11/2001	0	0	12	159	924	28	12	1111	1123
9/28/2002	0	0	28	109	742	8	28	859	887
5/1/2003	0	40	1	19	530	8	41	557	598
9/28/2003	20	44	22	15	516	0	66	531	597
5/14/2005	0	13	35	180	777	11	48	968	1016
10/14/2006	2	29	61	182	670	5	90	857	947
10/21/2007	0	6	44	89	467	4	50	560	610
2/11/2008	55	47	30	61	318	12	77	391	468
4/6/2008	5	15	45	151	1019	0	60	1170	1230
9/26/2008	0	0	0	100	753	0	0	853	853
10/17/2009	9	27	66	94	537	10	93	641	734
10/12/2011		0	427	345	253	0	427	598	1025
10/10/2012	0	1	188	115	281	0	189	396	585

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

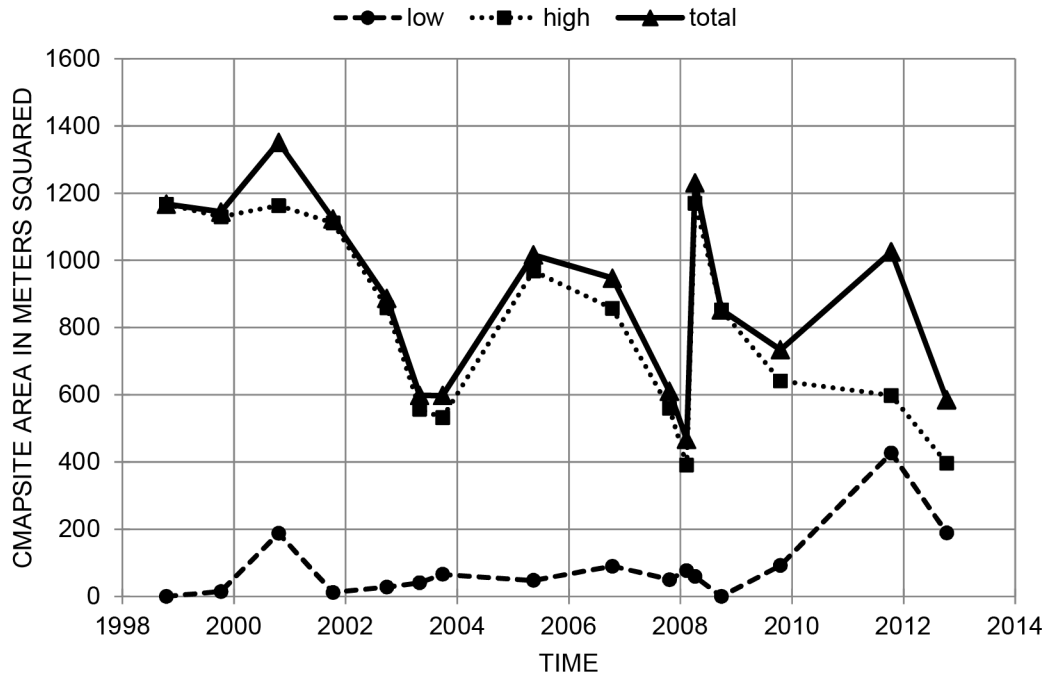
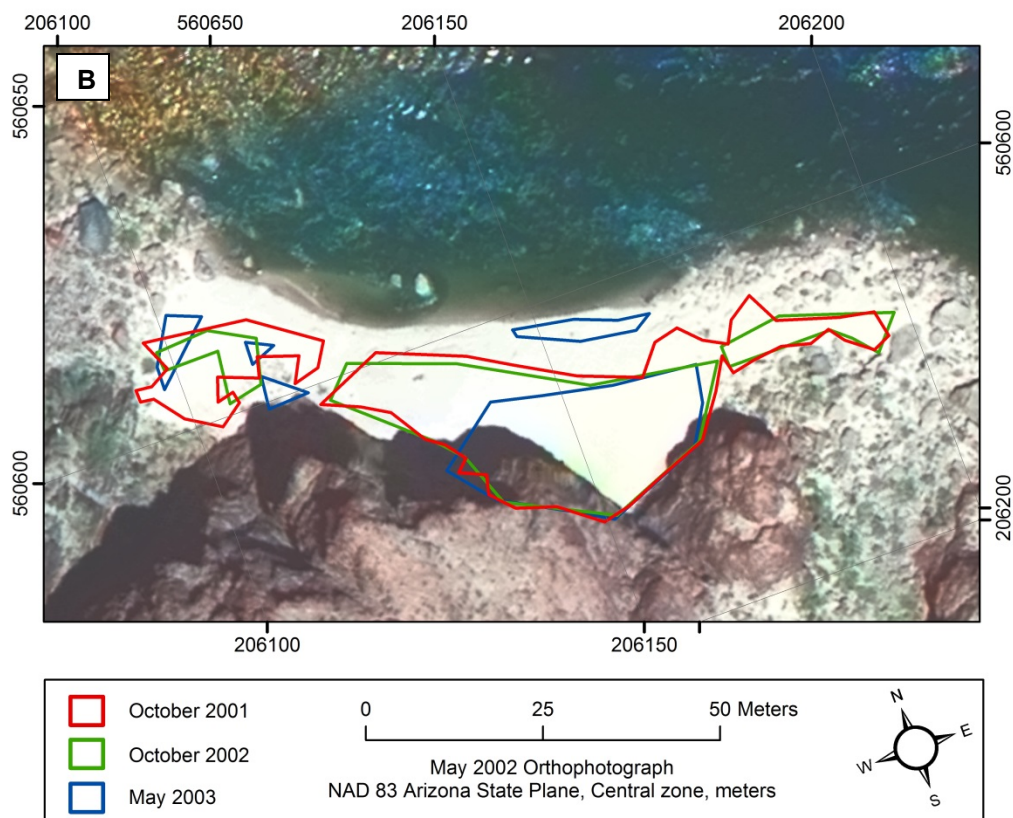
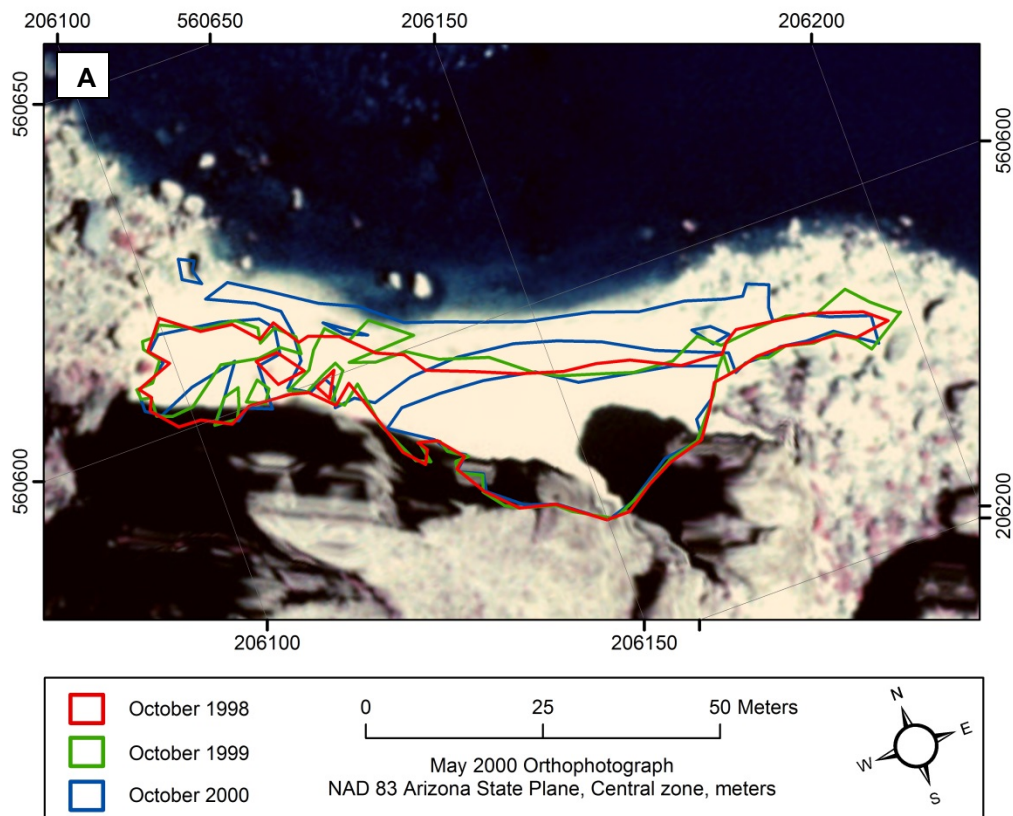
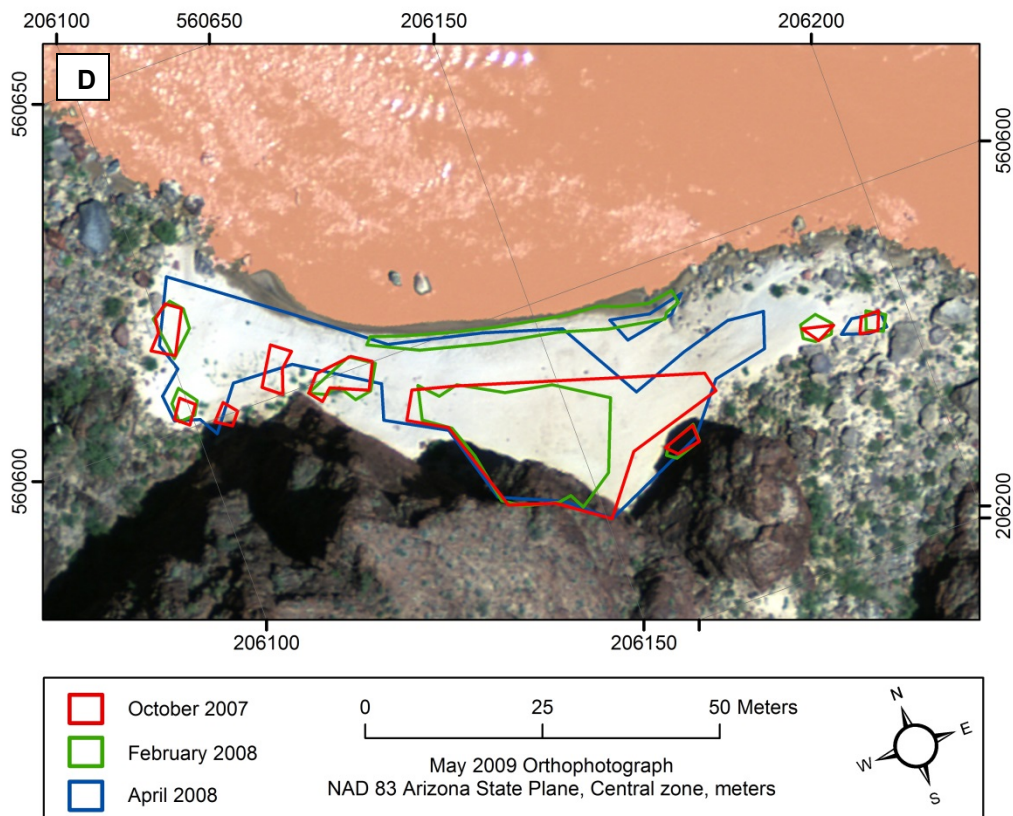
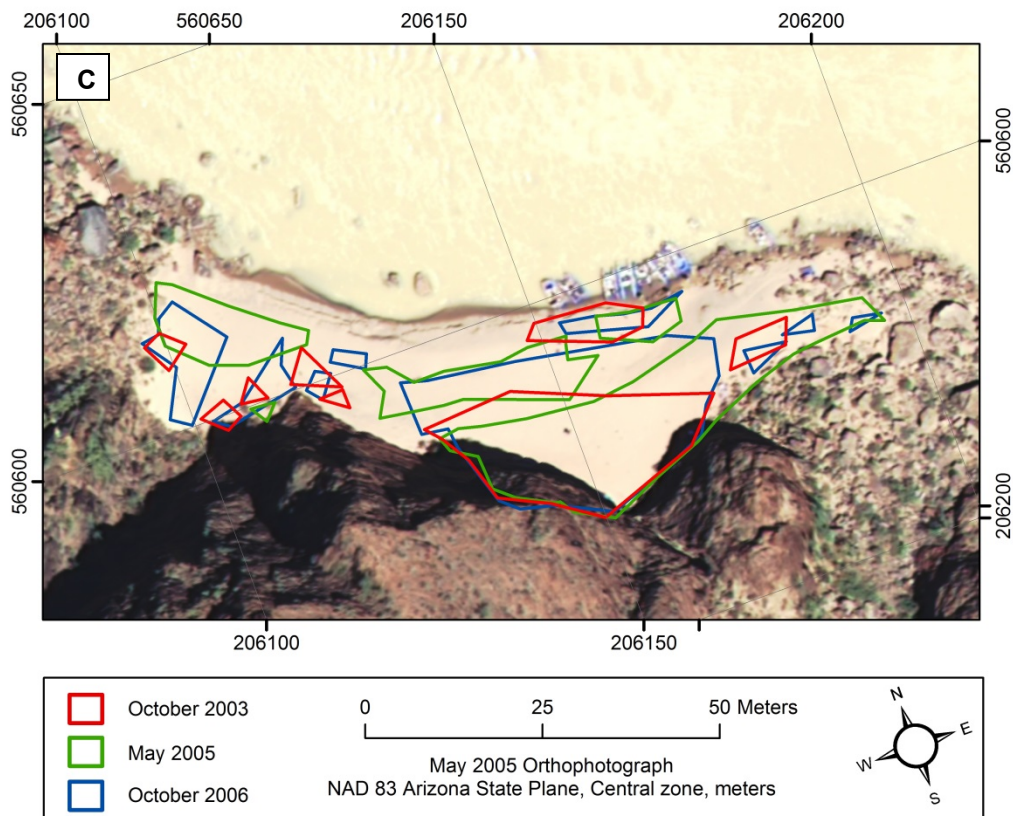


Figure A66. Time series plot showing campsite area at Grapevine camp (River Mile 81.7L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A18 for data.





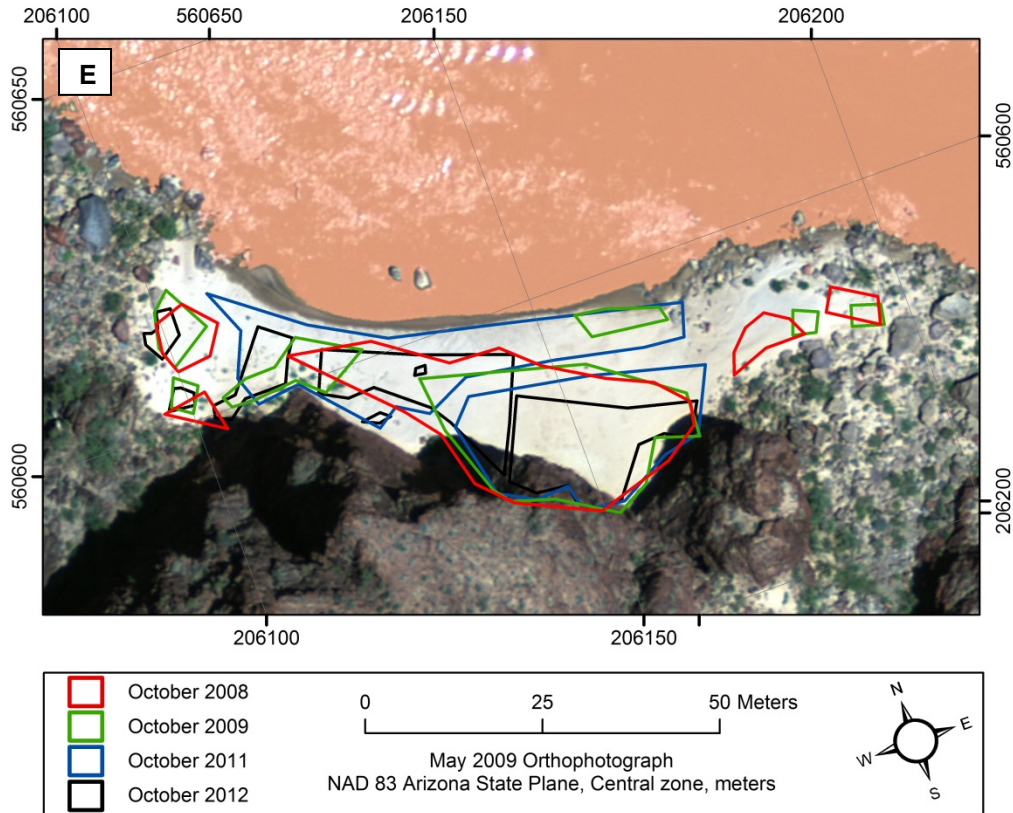


Figure A67. Maps showing campsite areas measured at Grapevine camp (River Mile 81.7L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A68. Remote camera photographs showing Grapevine camp located at River Mile 81.7L. Flow in main channel is from left to right. (A) Photograph taken on October 16, 1998; (B) Photograph taken on October 11, 2012.

Campsite Name: Clear Creek

River Mile: 84.6, River Right

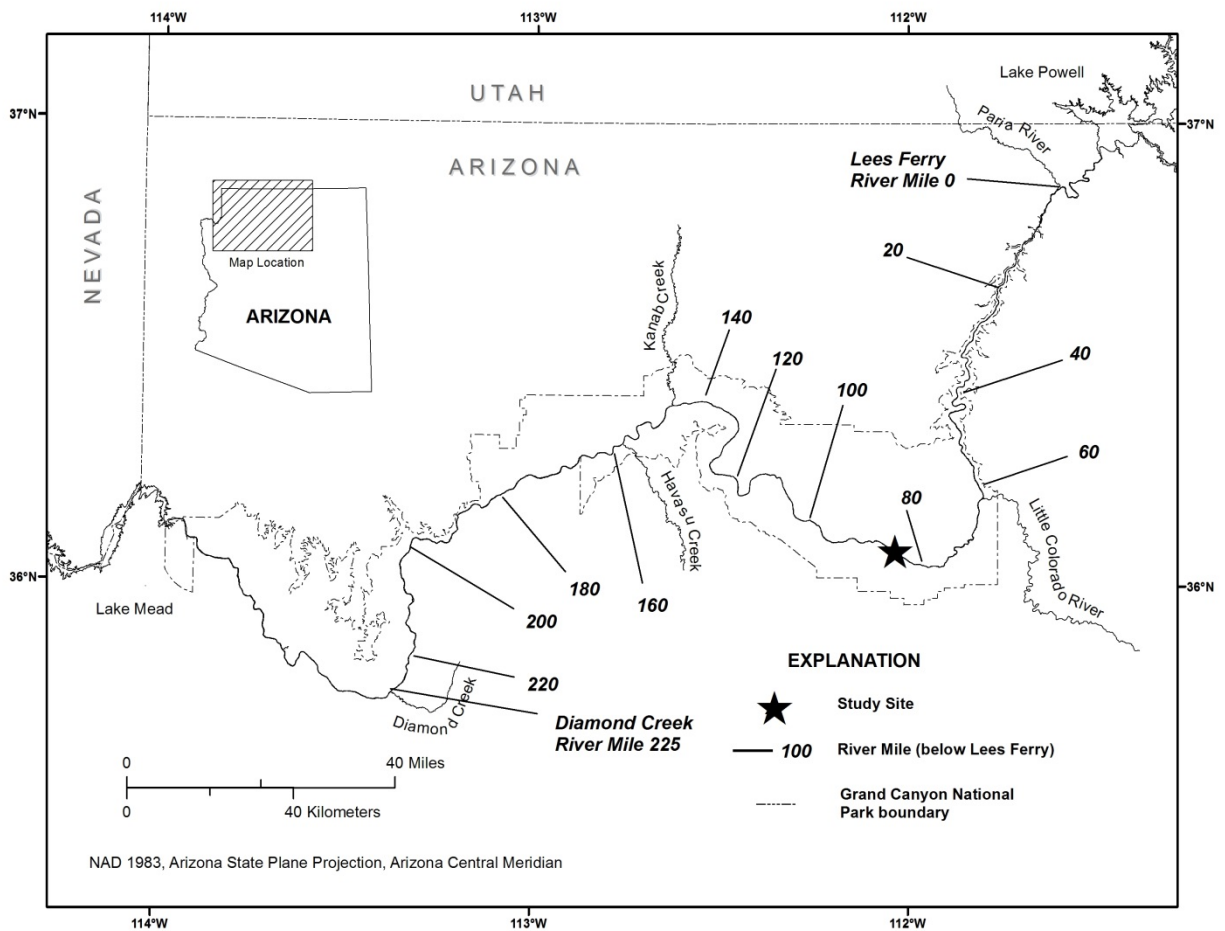


Figure A69. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Clear Creek camp study site (River Mile 84.6R).

Table A19. Campsite area in different stage-elevation zones at Clear Creek camp (River Mile 84.6R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/20/2000	178	182	0	15	51	31	182	97	279
							0		0
9/28/2002	134	160	0	0	0	20	160	20	180
5/3/2003	1	188	0	0	0	13	188	13	201
9/28/2003	189	147	0	0	0	19	147	19	165
5/14/2005	87	86	0	0	9	4	86	13	99
10/14/2006	5	31	0	0	10	5	31	15	46
10/21/2007	83	73	0	0	8	4	73	12	85
2/11/2008	260	105	4	2	35	45	109	82	191
4/6/2008	0	91	6	24	67	7	97	98	195
9/27/2008	94	65	0	3	39	22	65	64	129
10/17/2009	192	38	5	0	41	24	42	66	108
10/12/2011		0	35	2	39	29	35	70	104
10/10/2012	208	58	3	0	50	35	61	84	145

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

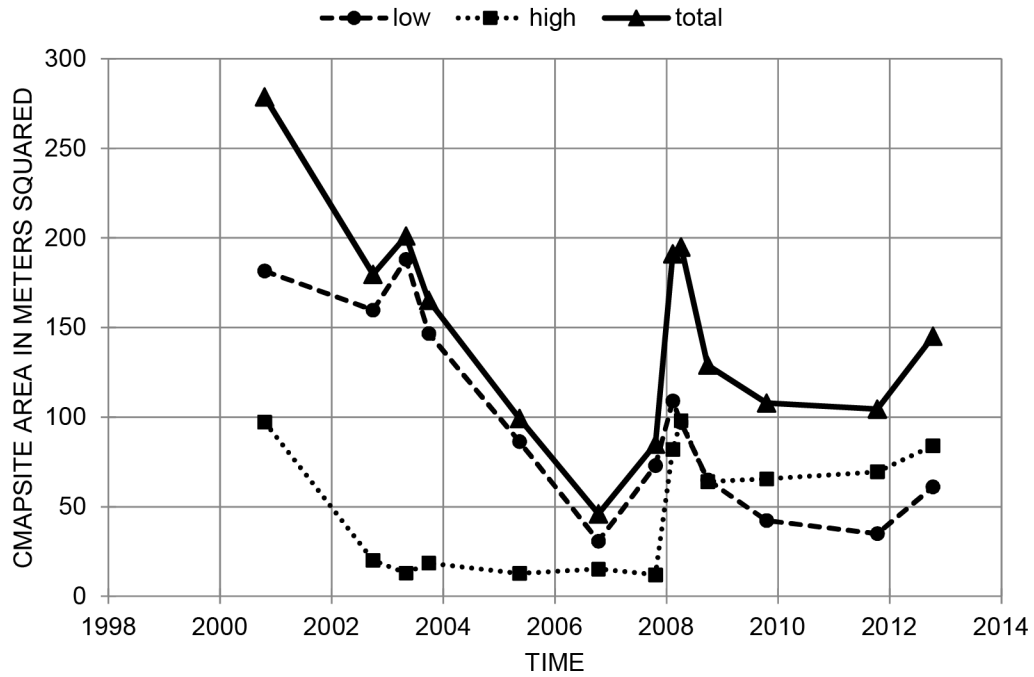
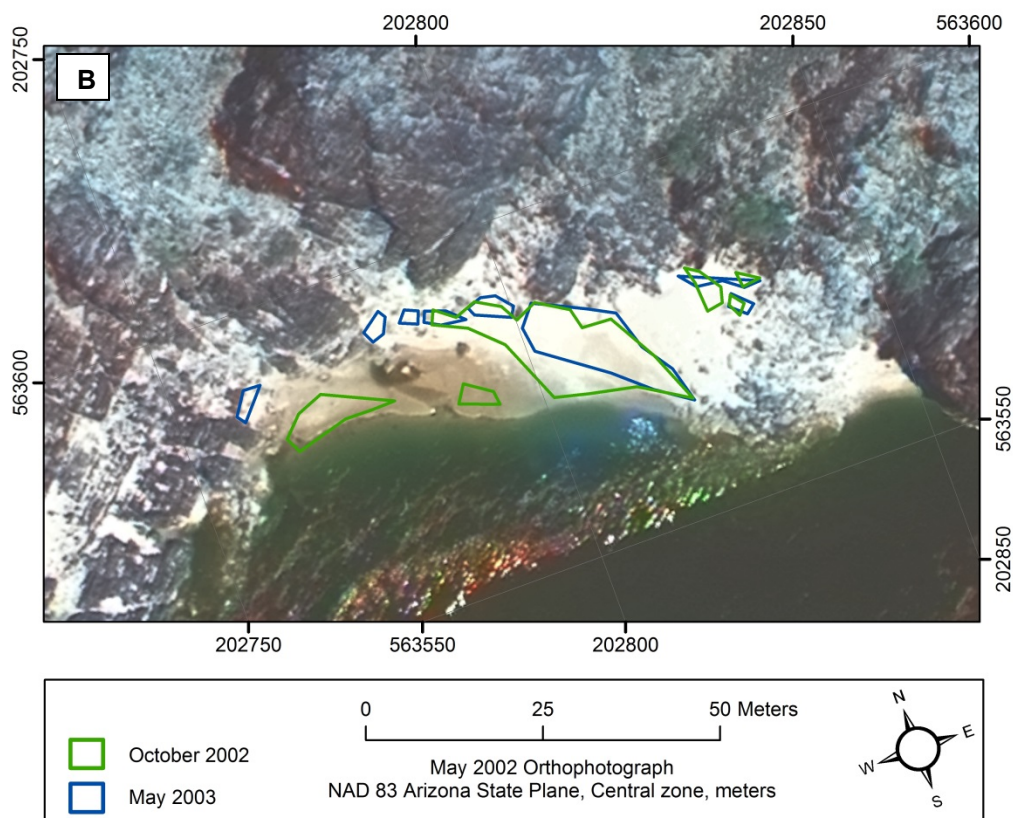
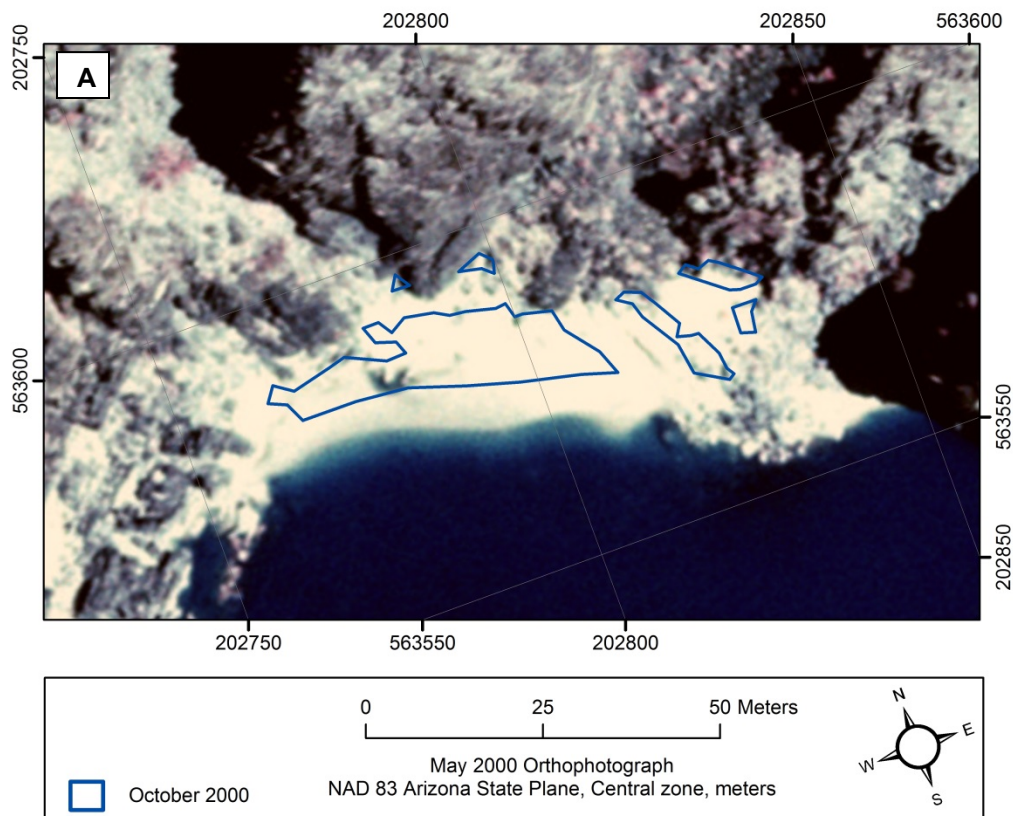
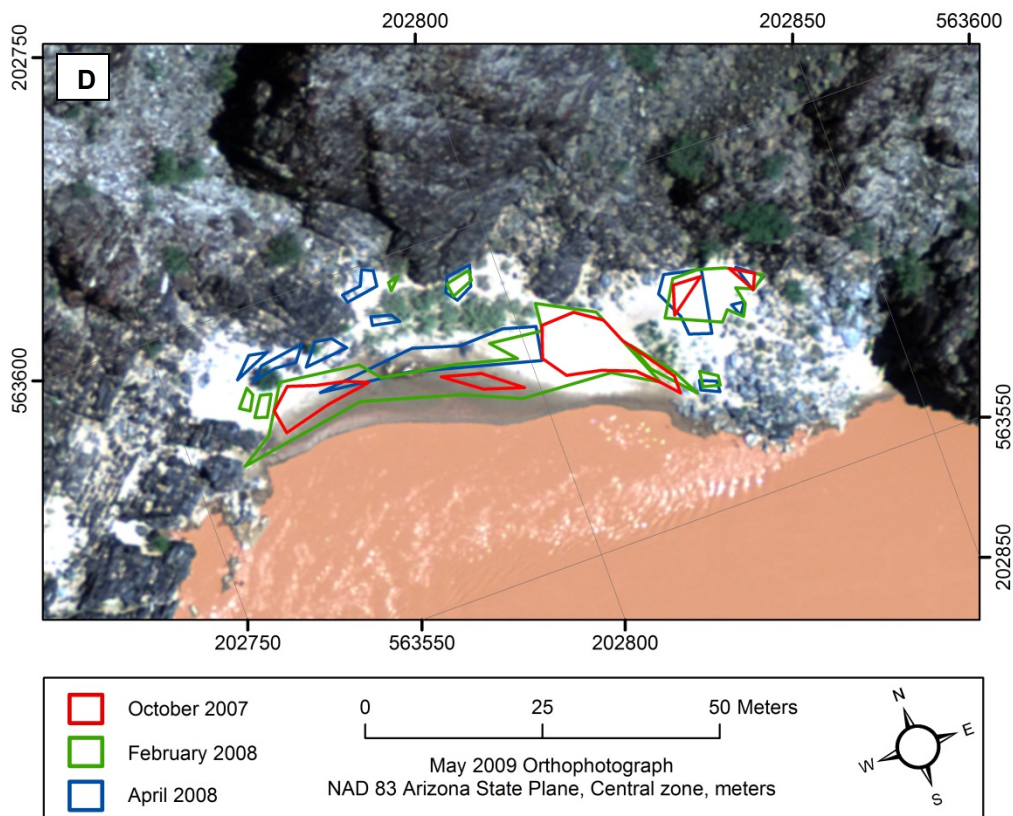
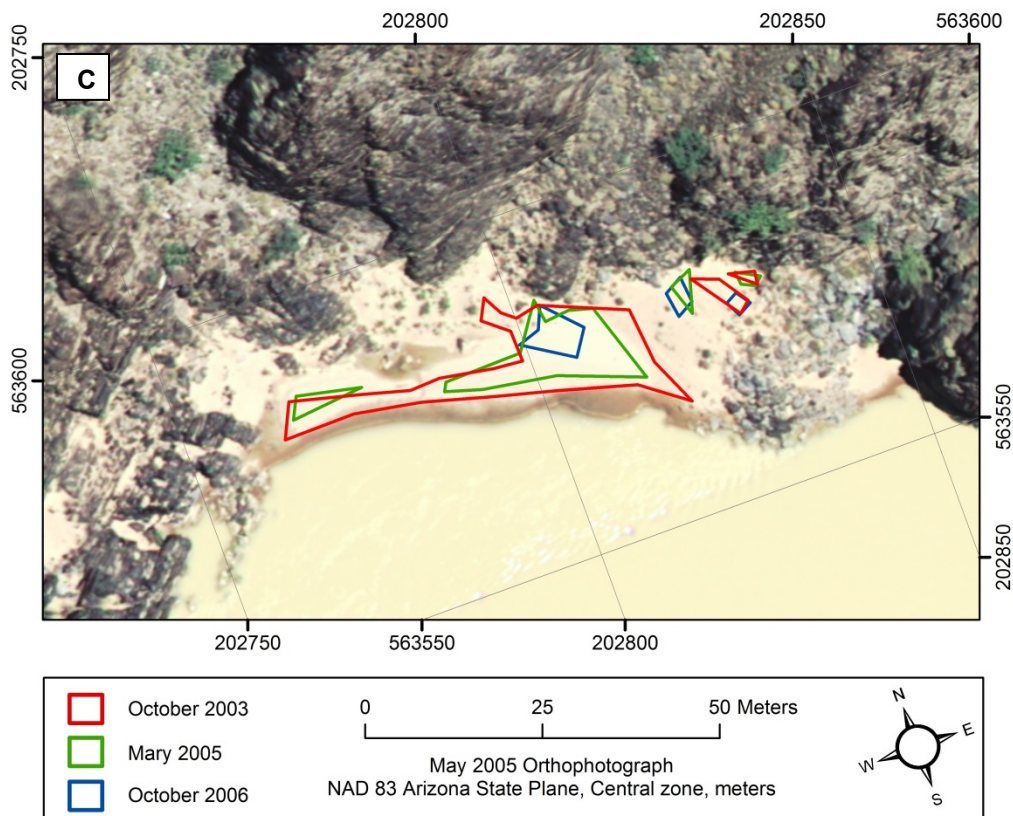


Figure A70. Time series plot showing campsite area at Clear Creek camp (River Mile 84.6R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to Table A19 for data.





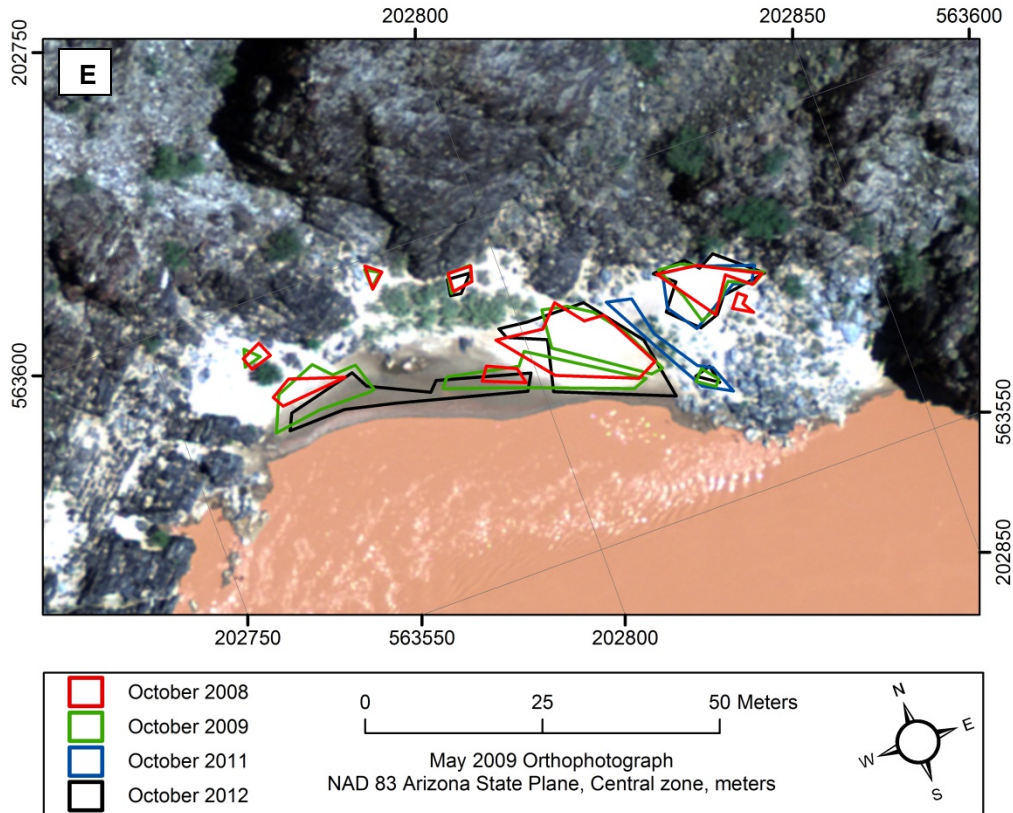


Figure A71. Maps showing campsite areas measured at Clear Creek camp (River Mile 84.6R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.

Campsite Name: Cremation
River Mile: 87.7, River Left

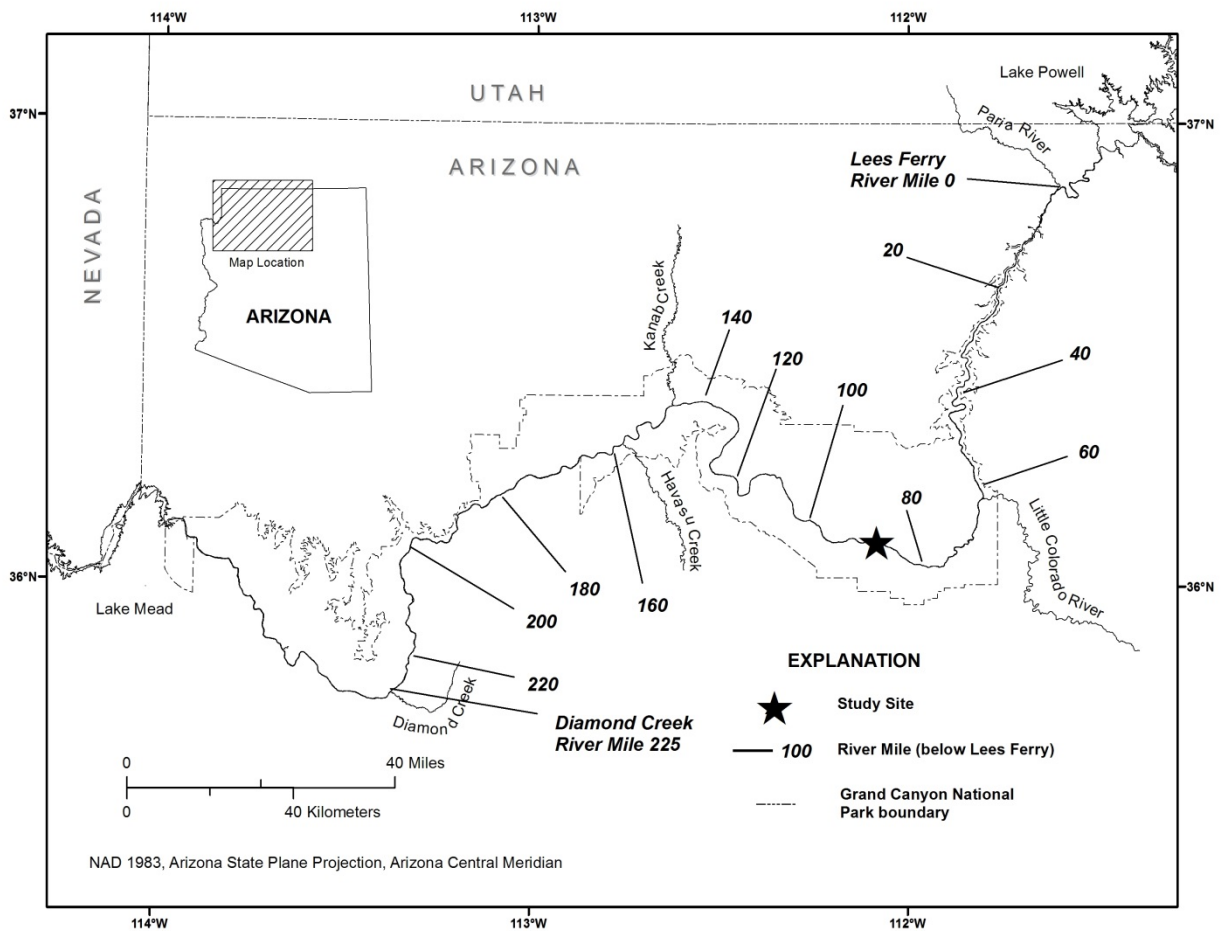


Figure A72. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Cremation camp study site (River Mile 87.7L).

Table A20. Campsite area in different stage-elevation zones at Cremation camp (River Mile 87.7L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								total (m ²)
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	
10/12/1998		0	5	65	229	125	5	419	424
10/8/1999		0	0	47	144	71	0	262	262
10/20/2000	35	50	35	66	150	77	85	293	378
10/12/2001	21	1	5	28	126	55	6	209	215
9/29/2002	76	102	21	43	137	74	123	254	377
5/3/2003	0	96	21	32	121	45	117	198	315
9/29/2003	64	73	13	22	121	52	86	195	281
5/14/2005	0	0	17	25	115	69	17	209	226
10/15/2006	14	60	0	10	121	32	60	163	223
10/21/2007	45	84	0	8	103	38	84	149	233
4/6/2008	0	0	0	38	199	65	0	302	302
10/19/2008	9	0	9	4	143	59	9	206	215
10/17/2009	35	23	15	0	137	4	38	141	178
10/12/2011		34	11	0	110	45	45	155	200
10/10/2012	18	6	6	8	119	44	12	171	183

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

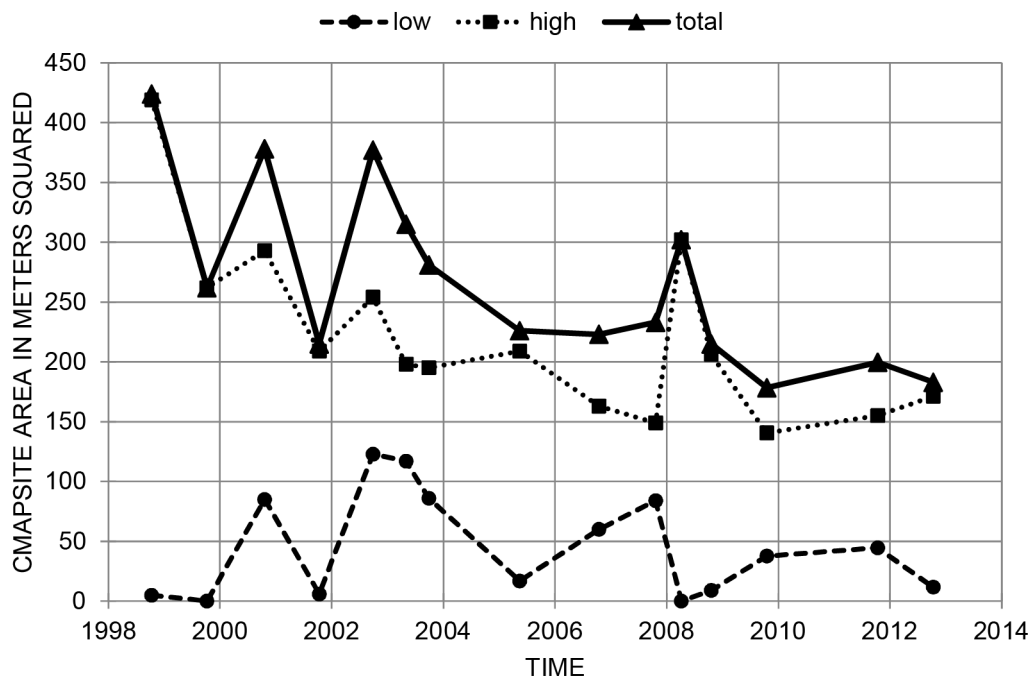
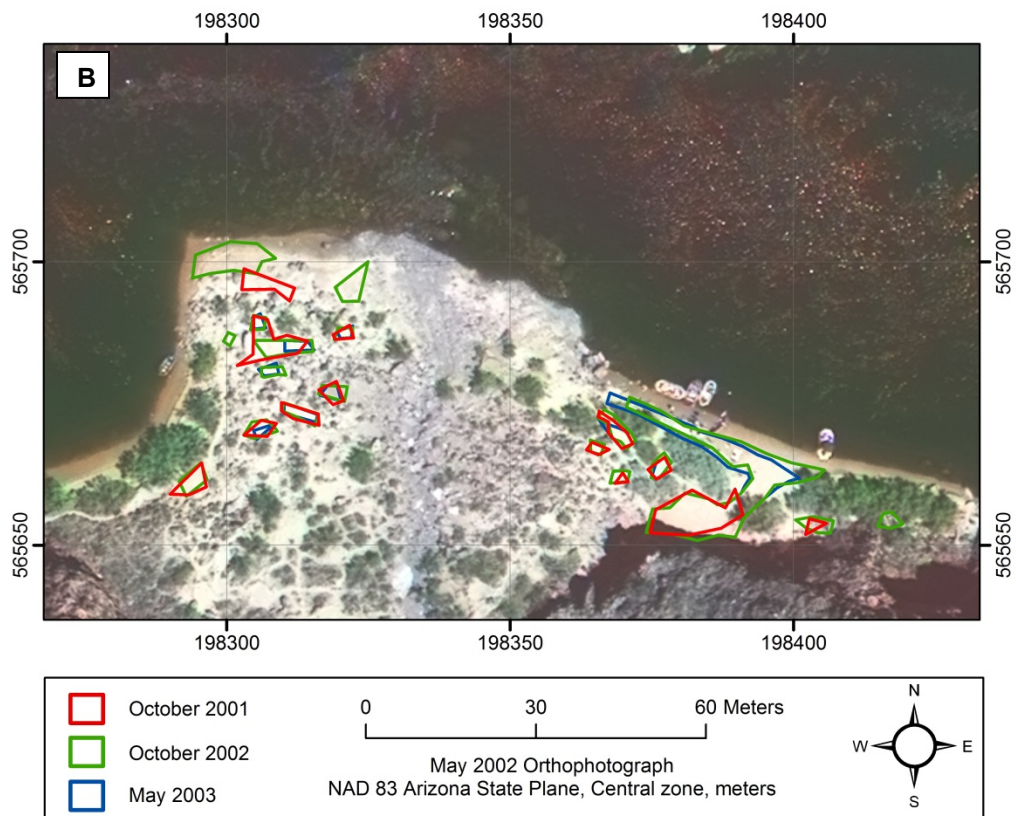
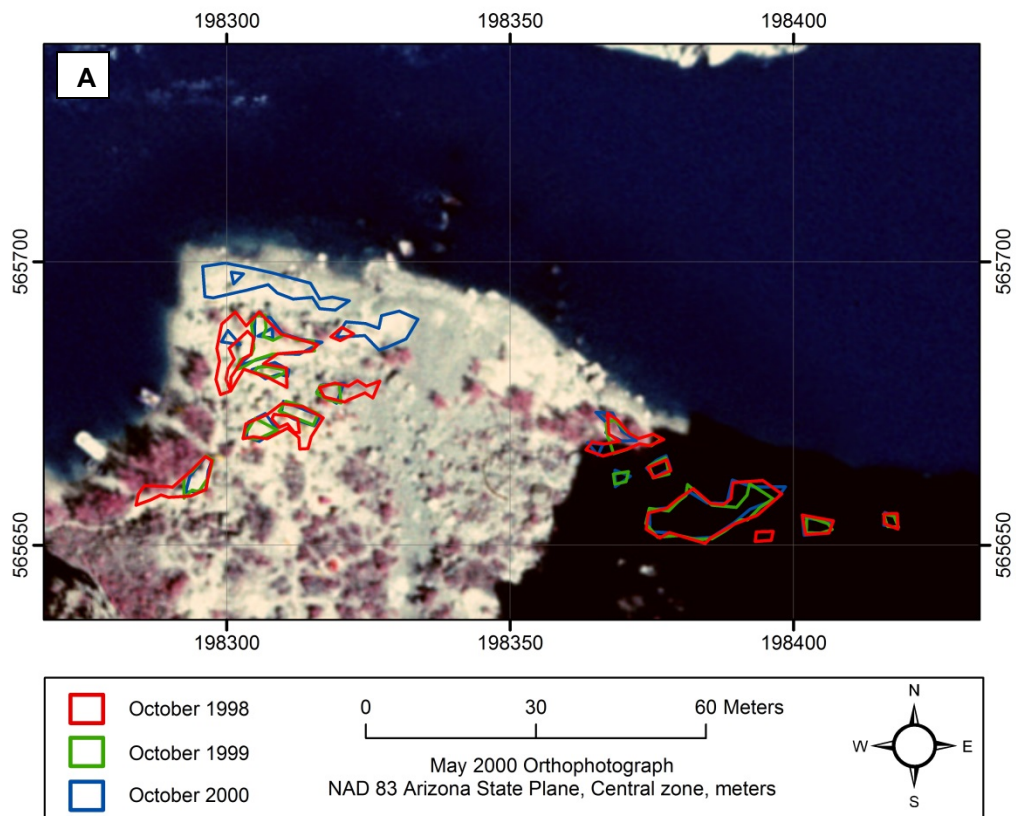
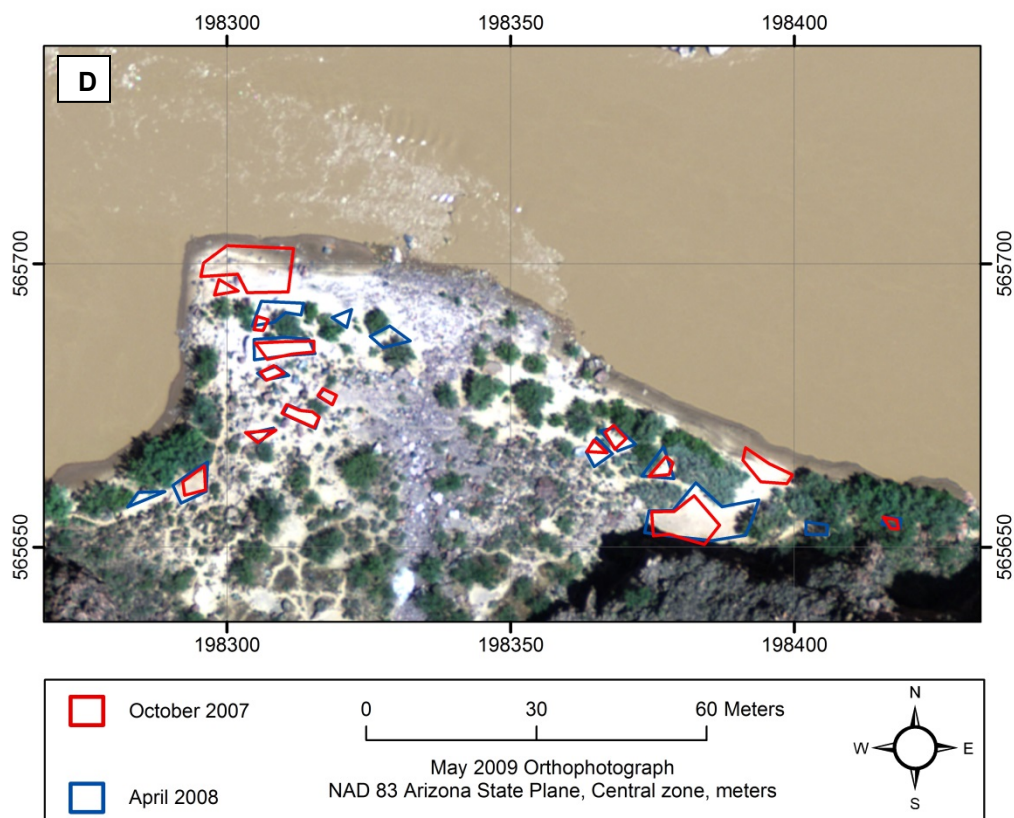
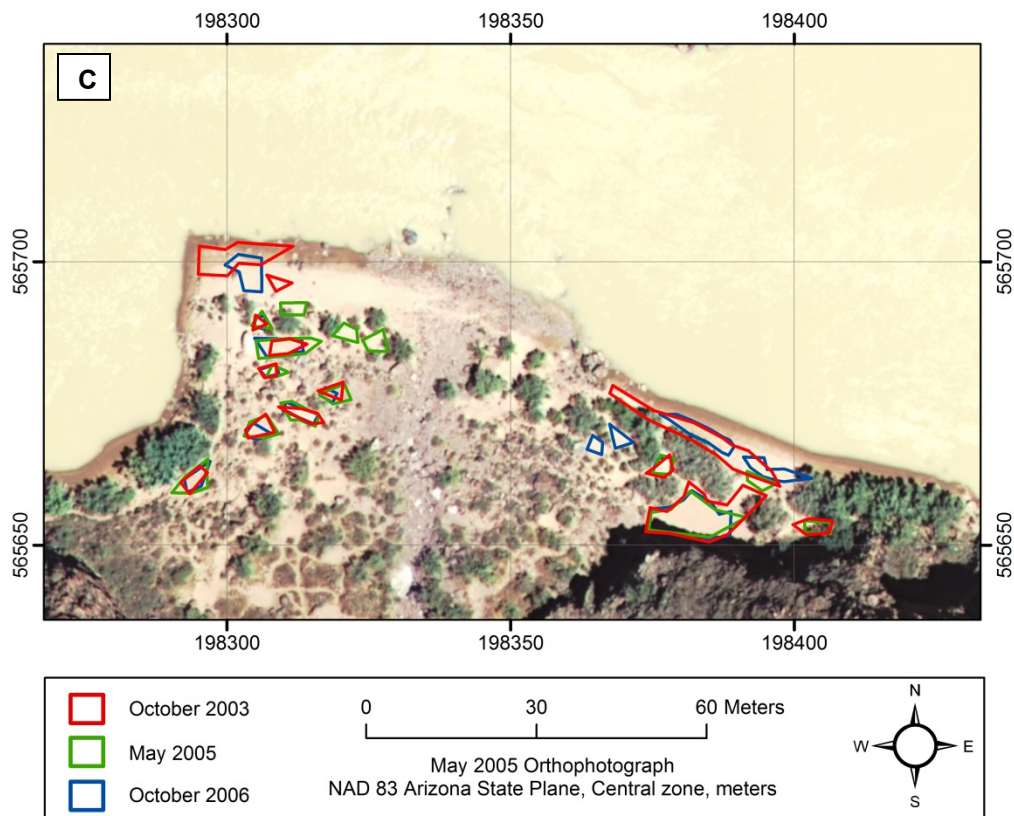


Figure A73. Time series plot showing campsite area at Cremation camp (River Mile 87.7L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A20 for data.





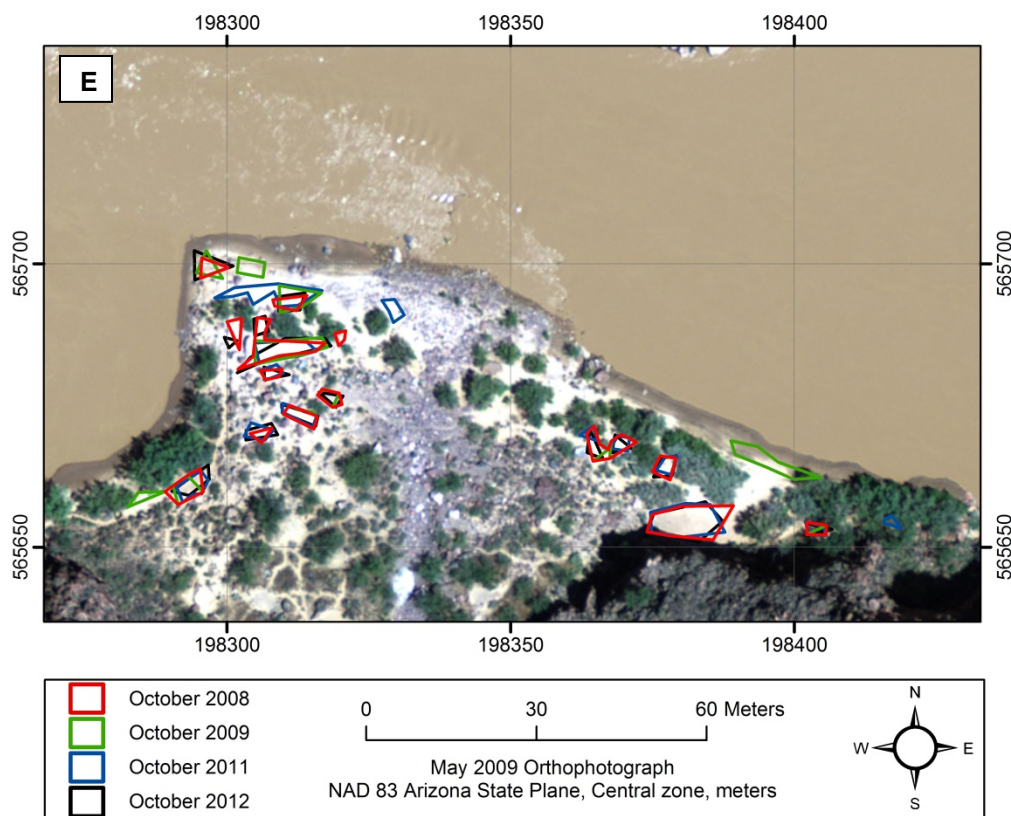


Figure A74. Maps showing campsite areas measured at Cremation camp (River Mile 87.7L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A75. Remote camera photographs of Cremation camp located at River Mile 87.7L. Flow in main channel is from left to right. (A) Photograph taken on January 6, 1999; (B) Photograph taken on October 10, 2012.

Campsite Name: 91 Mile – above Trinity

River Mile: 91.7, River Right

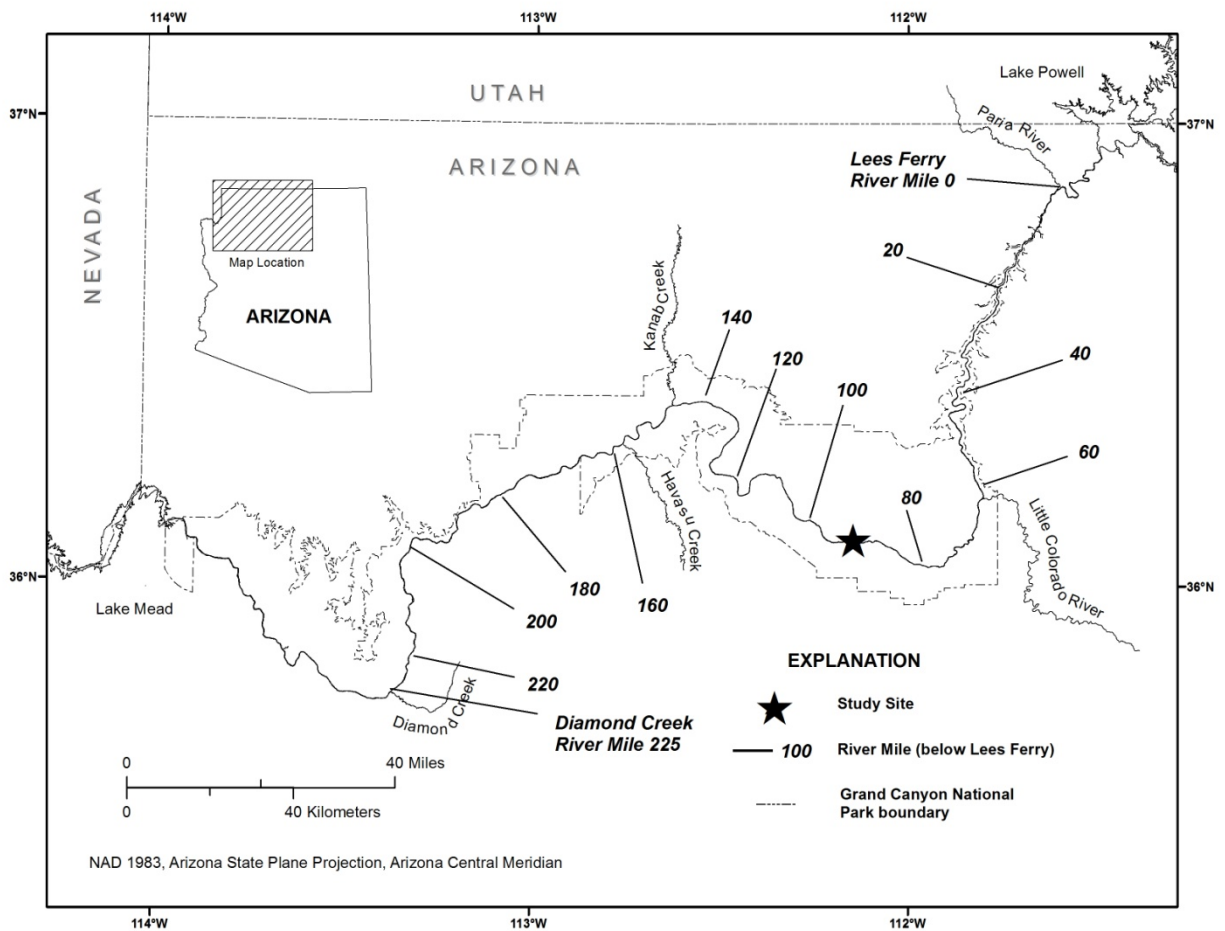


Figure A76. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 91 Mile camp study site (River Mile 91.7R).

Table A21. Campsite area in different stage-elevation zones at 91 Mile camp (River Mile 91.7R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	0	12	274	0	286	286
10/16/1999		0	0	0	29	257	0	286	286
10/21/2000		0	0	32	32	236	0	300	300
10/12/2001	0	0	0	0	58	249	0	307	307
9/29/2002	0	0	0	0	2	207	0	209	209
5/4/2003	0	22	0	0	31	223	22	254	275
9/28/2003	26	40	0	0	52	219	40	271	311
5/15/2005	0	0	0	0	50	230	0	280	280
10/16/2006	0	0	0	0	12	155	0	166	166
10/22/2007	2	35	0	0	0	129	35	129	164
2/12/2008	13	204	35	2	38	178	239	218	457
4/7/2008	0	0	0	0	72	142	0	214	214
10/19/2008	12	2	0	0	40	157	2	197	199
10/18/2009	96	27	3	2	78	190	31	270	301
10/12/2011		0	0	0	31	169	0	201	201
10/11/2012	169	125	7	0	60	203	132	264	396

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

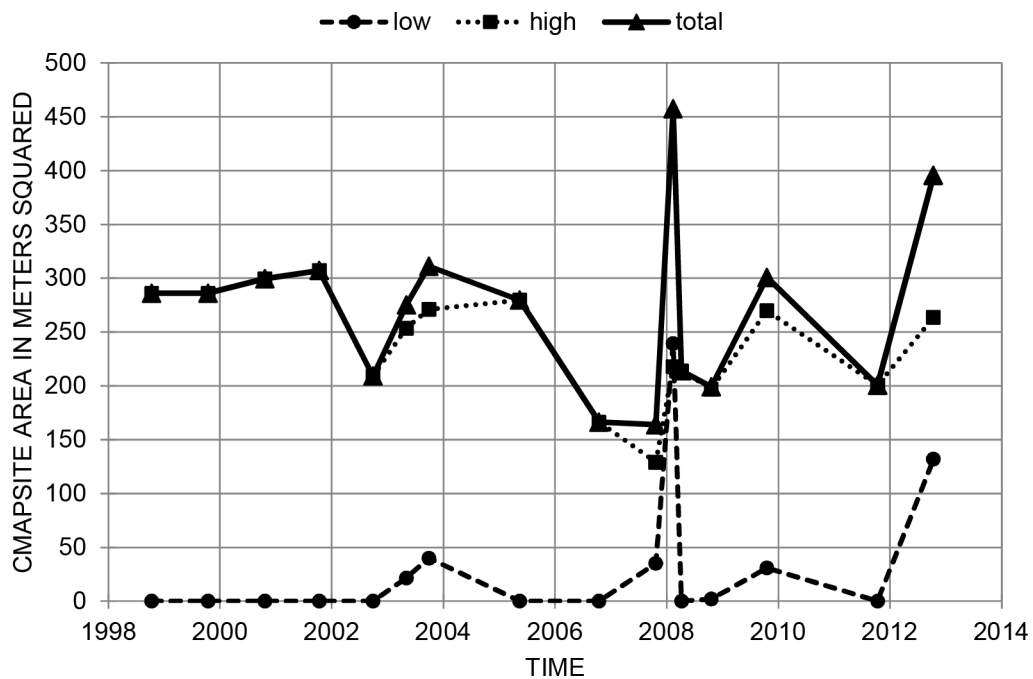
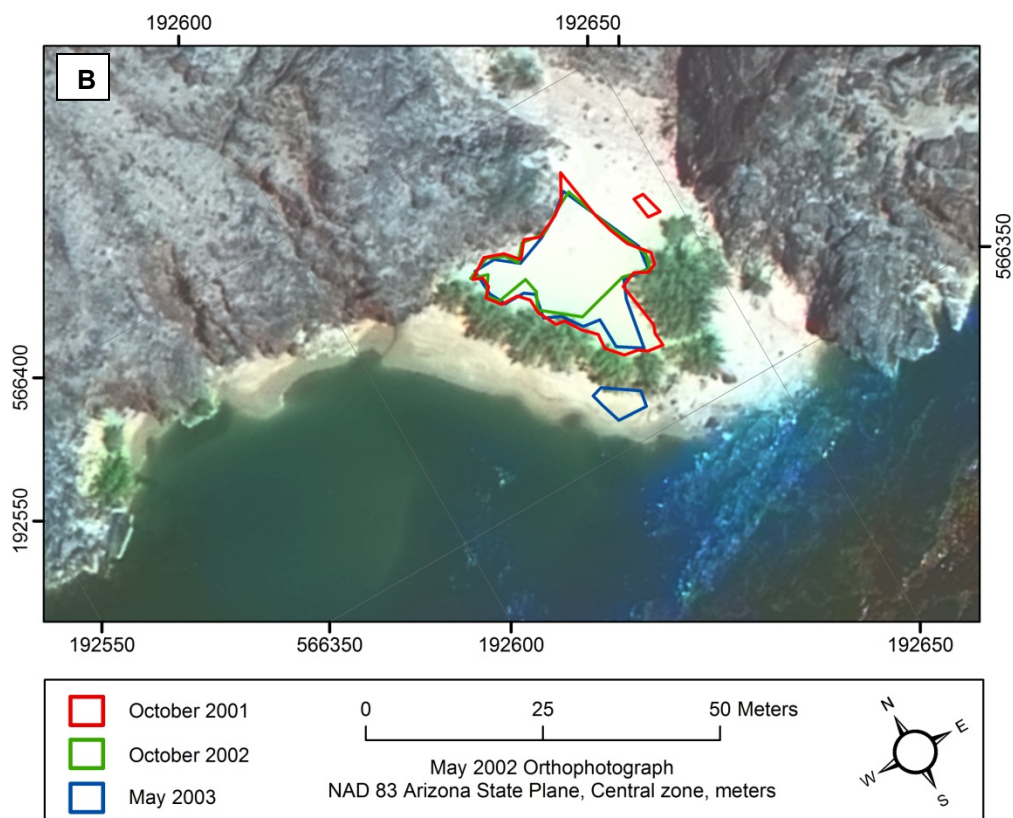
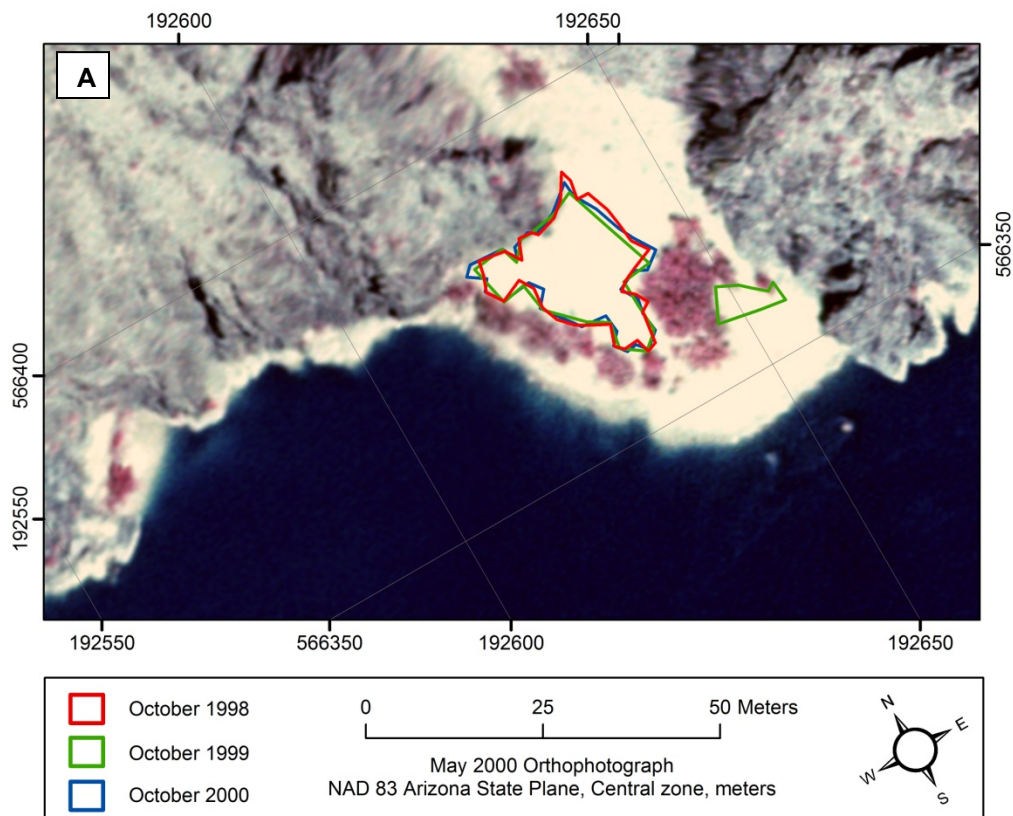
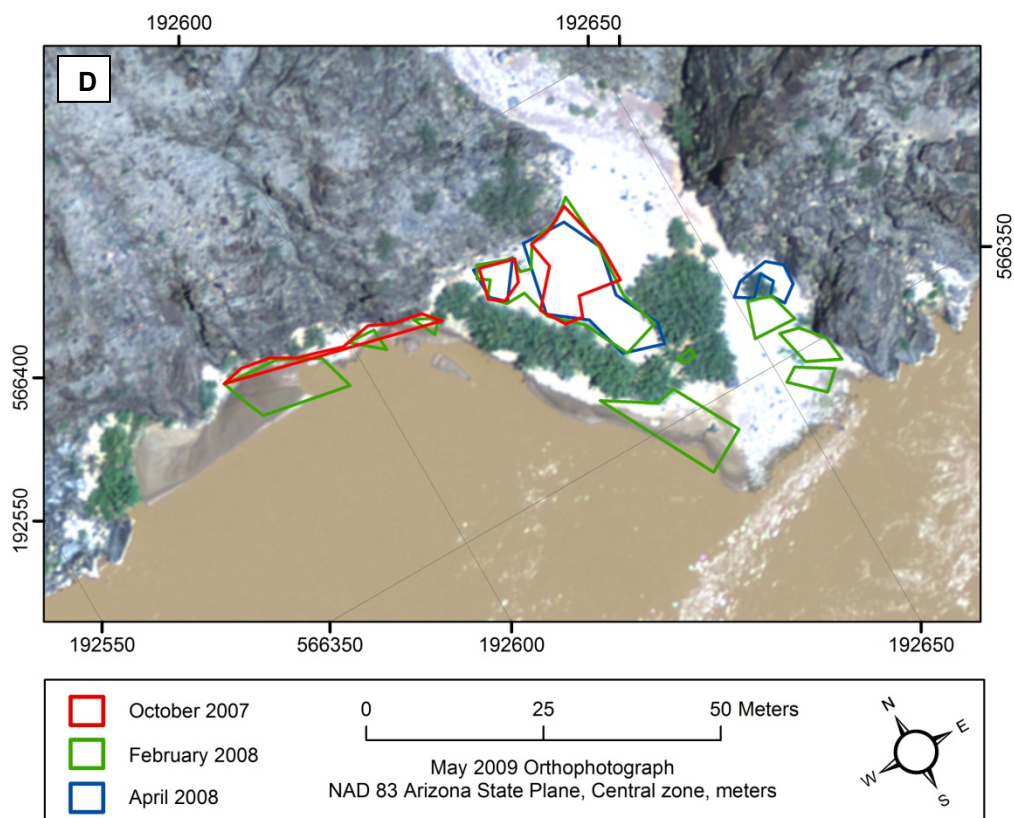
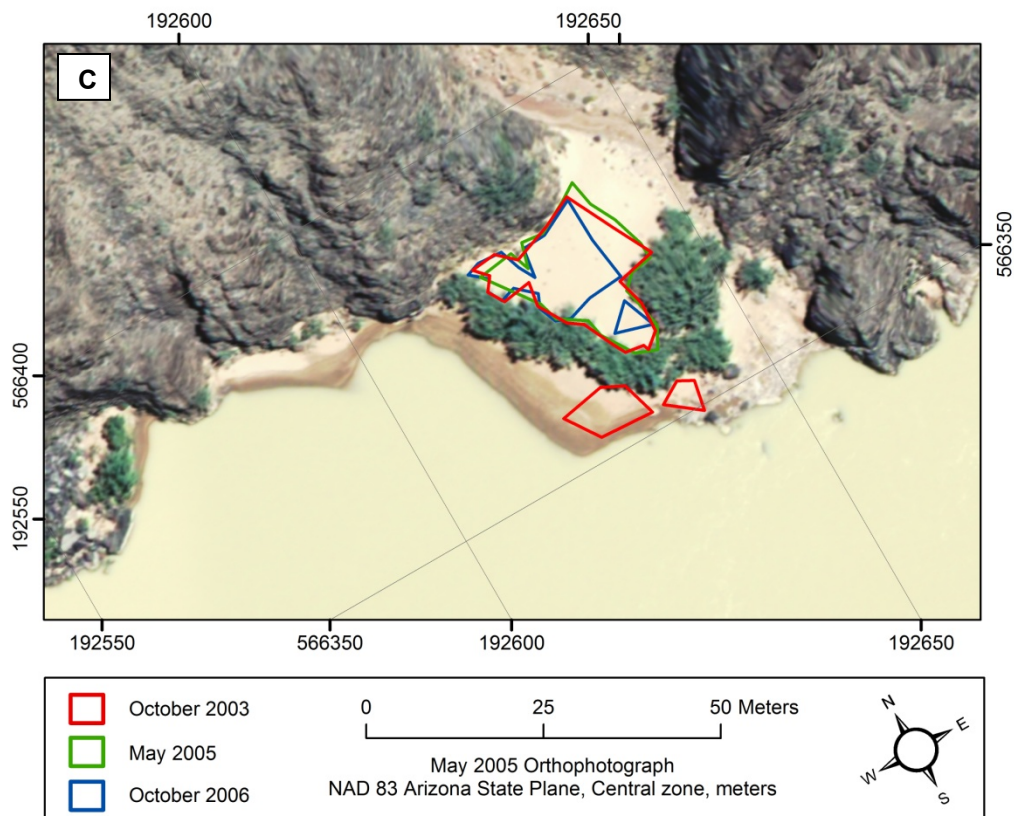


Figure A77. Time series plot of campsite area at 91 Mile camp (River Mile 91.7R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A21 for data.





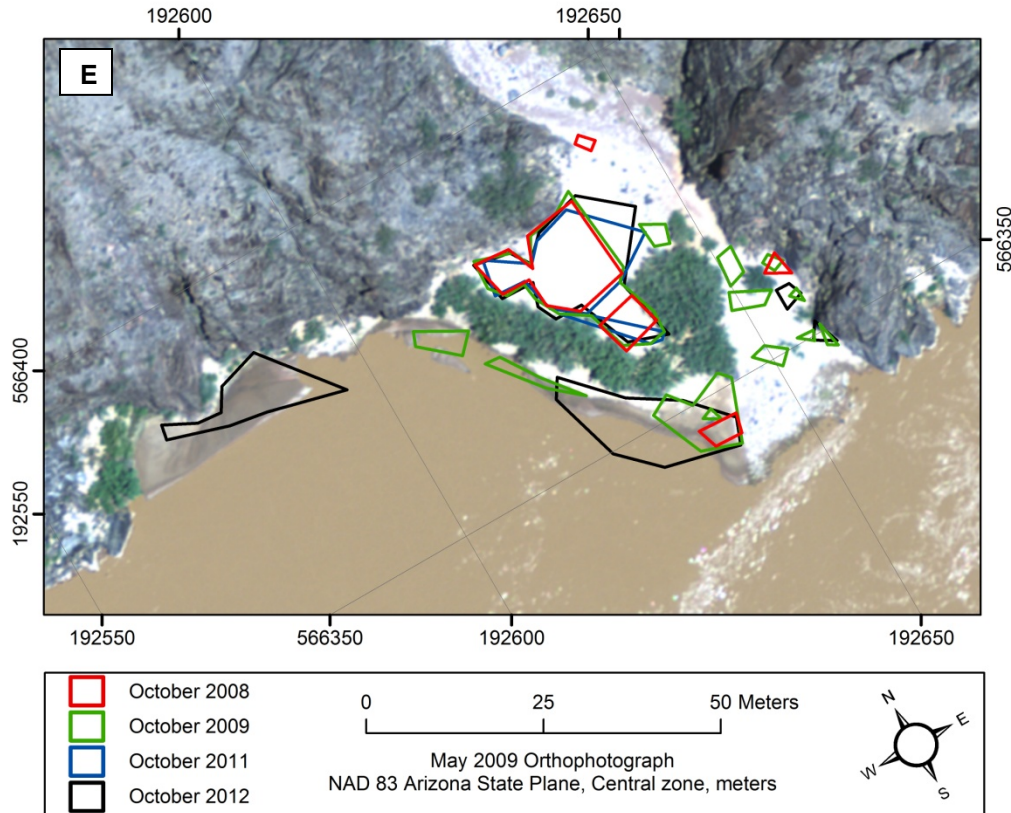


Figure A78. Maps showing campsite areas measured at 91 Mile camp (River Mile 91.7R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A79. Remote camera photographs showing 91 Mile camp located at River Mile 91.7R. Flow in main channel is from right to left. (A) Photograph taken on March 28, 1998; (B) Photograph taken on October 11, 2012.

Campsite Name: Granite

River Mile: 93.8, River Left

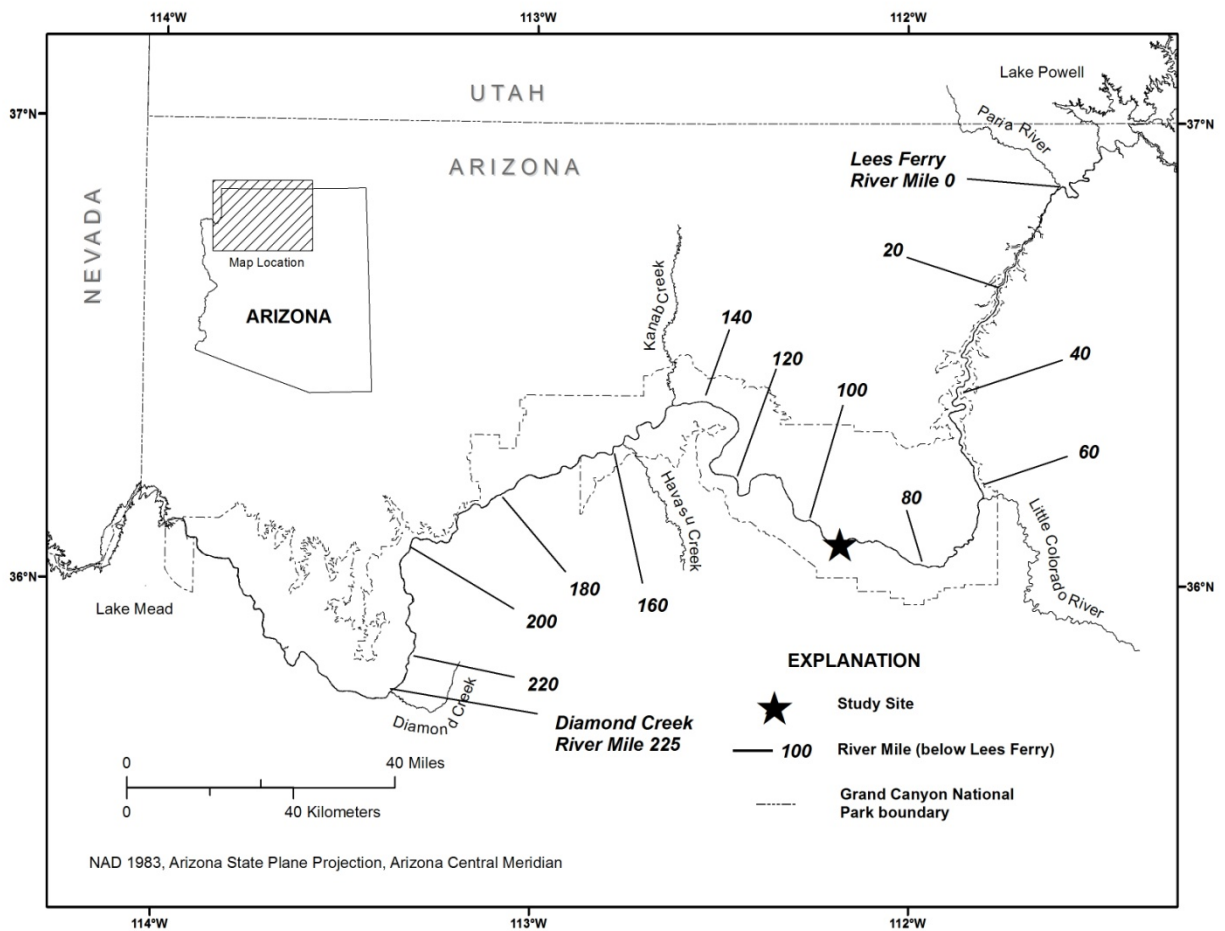


Figure A80. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Granite camp study site (River Mile 93.8L).

Table A22. Campsite area in different stage-elevation zones at Granite camp (River Mile 93.8L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	189	3	11	0	203	203
10/9/1999		0	0	84	66	12	0	162	162
10/21/2000		85	162	267	49	16	247	332	579
10/12/2001	0	0	32	137	50	14	32	201	233
9/29/2002	17	184	33	103	41	12	217	156	373
5/4/2003	0	376	29	122	43	11	405	176	581
9/28/2003	0	258	18	91	36	10	276	137	413
5/15/2005	0	0	0	58	82	12	0	152	152
10/16/2006	0	0	44	75	134	10	44	219	263
10/22/2007	1	151	49	58	64	8	200	130	330
2/12/2008	0	71	17	16	23	6	88	45	133
4/7/2008	0	0	8	22	292	11	8	325	333
10/20/2008	0	0	4	7	218	6	4	231	235
10/18/2009	70	0	0	30	185	0	0	215	215
10/12/2011		0	0	3	115	0	0	117	117
10/11/2012	0	10	8	8	97	2	18	106	124

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

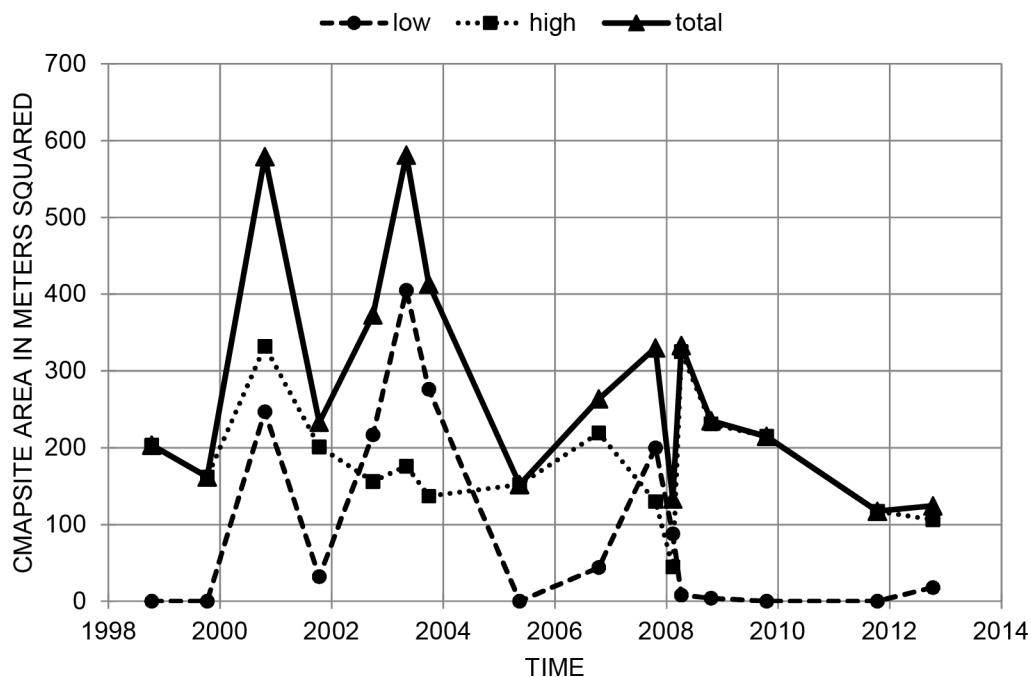
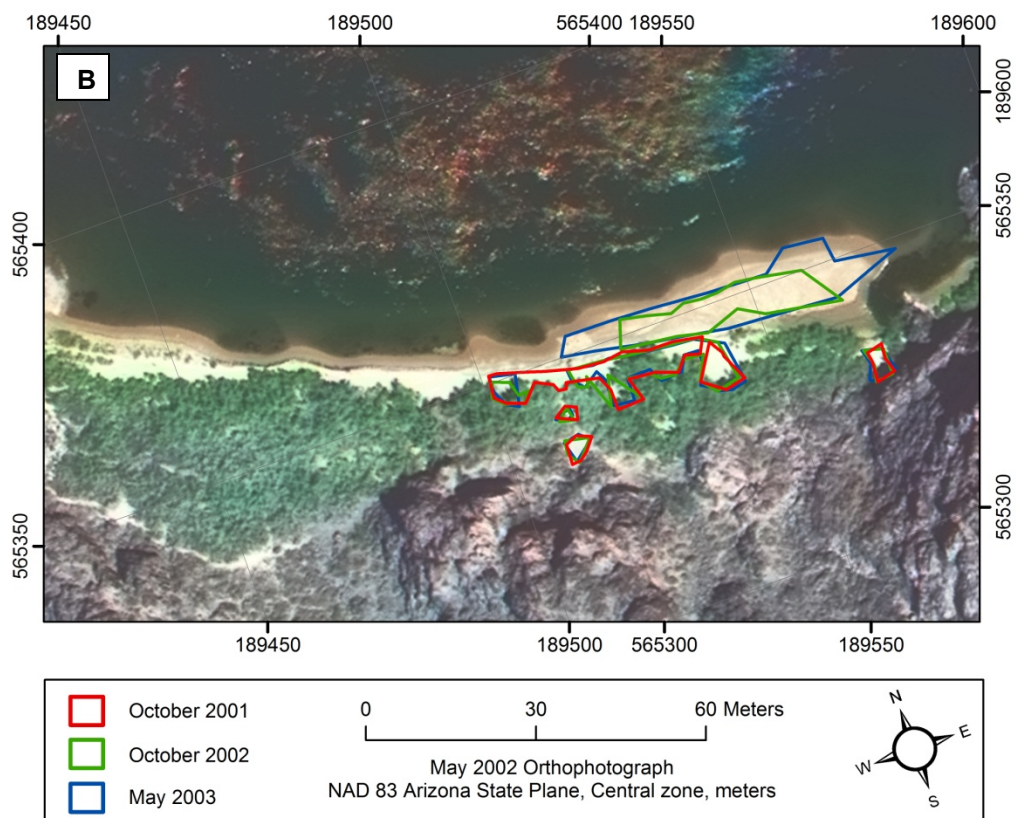
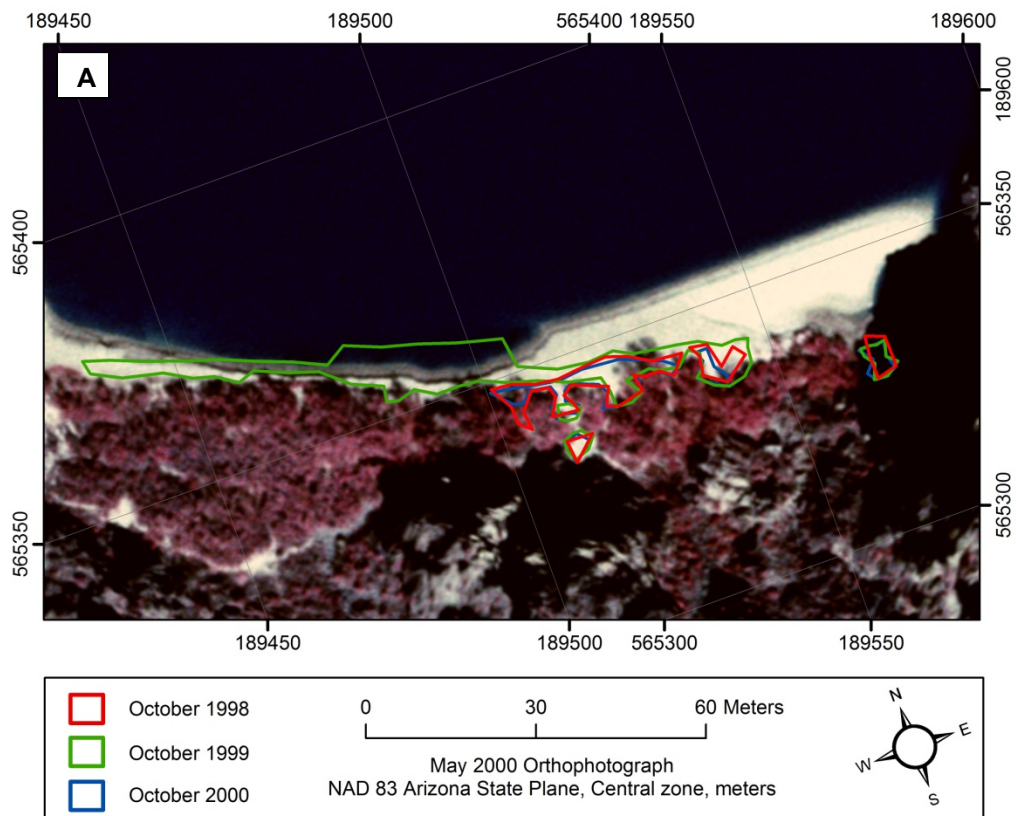
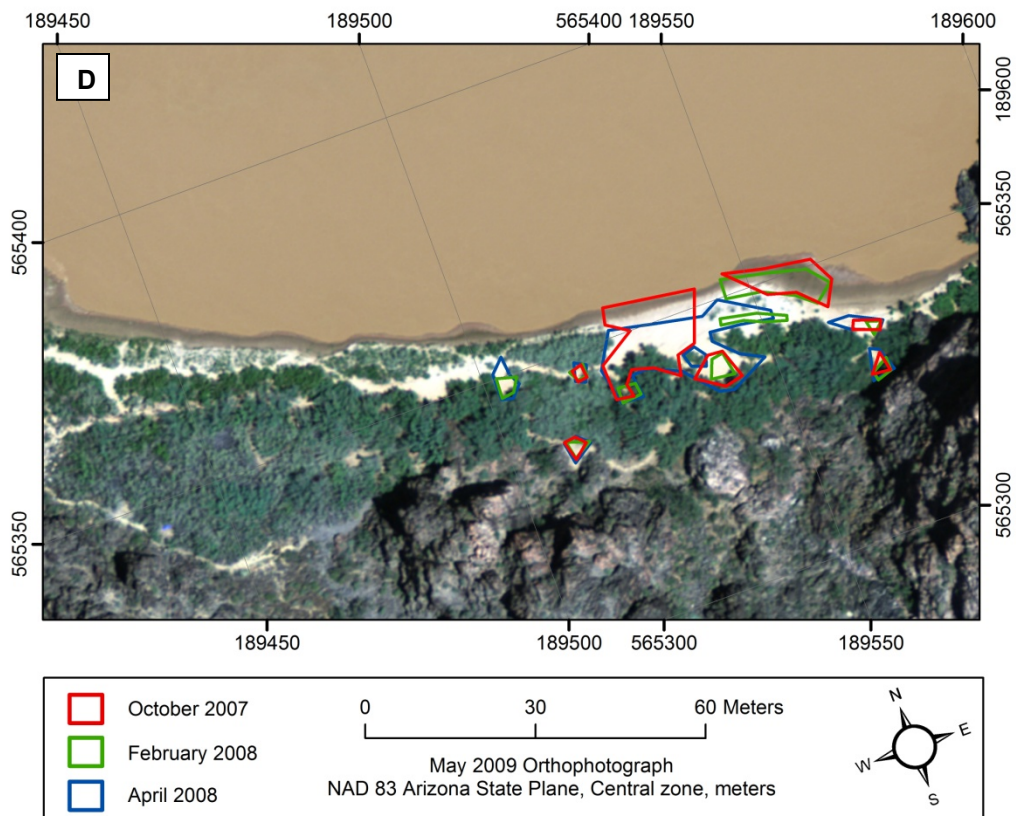
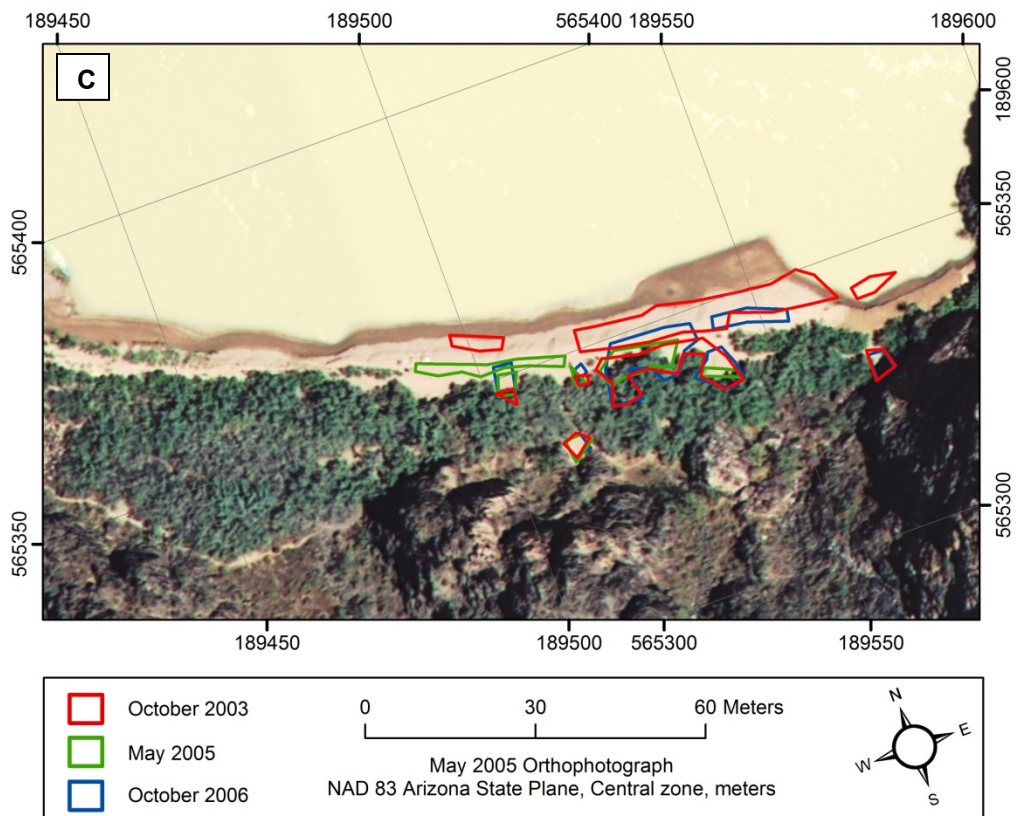


Figure A81. Time series plot of campsite area at Granite camp (River Mile 93.8L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A22 for data.





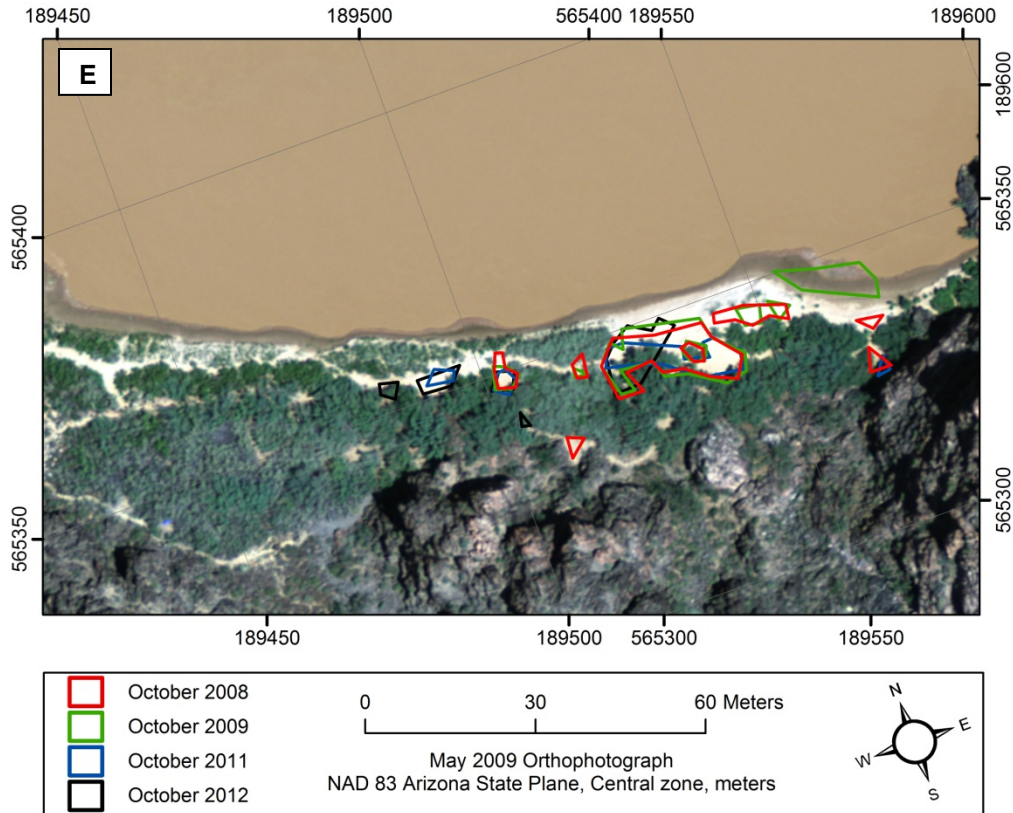


Figure A82. Maps showing campsite areas measured at Granite camp (River Mile 93.8L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A83. Remote camera photograph showing Granite Camp at River Mile 93.8L. Flow in main channel is from left to right. Photograph taken on October 10, 2012.

Campsite Name: 104 Mile

River Mile: 104.4, River Right

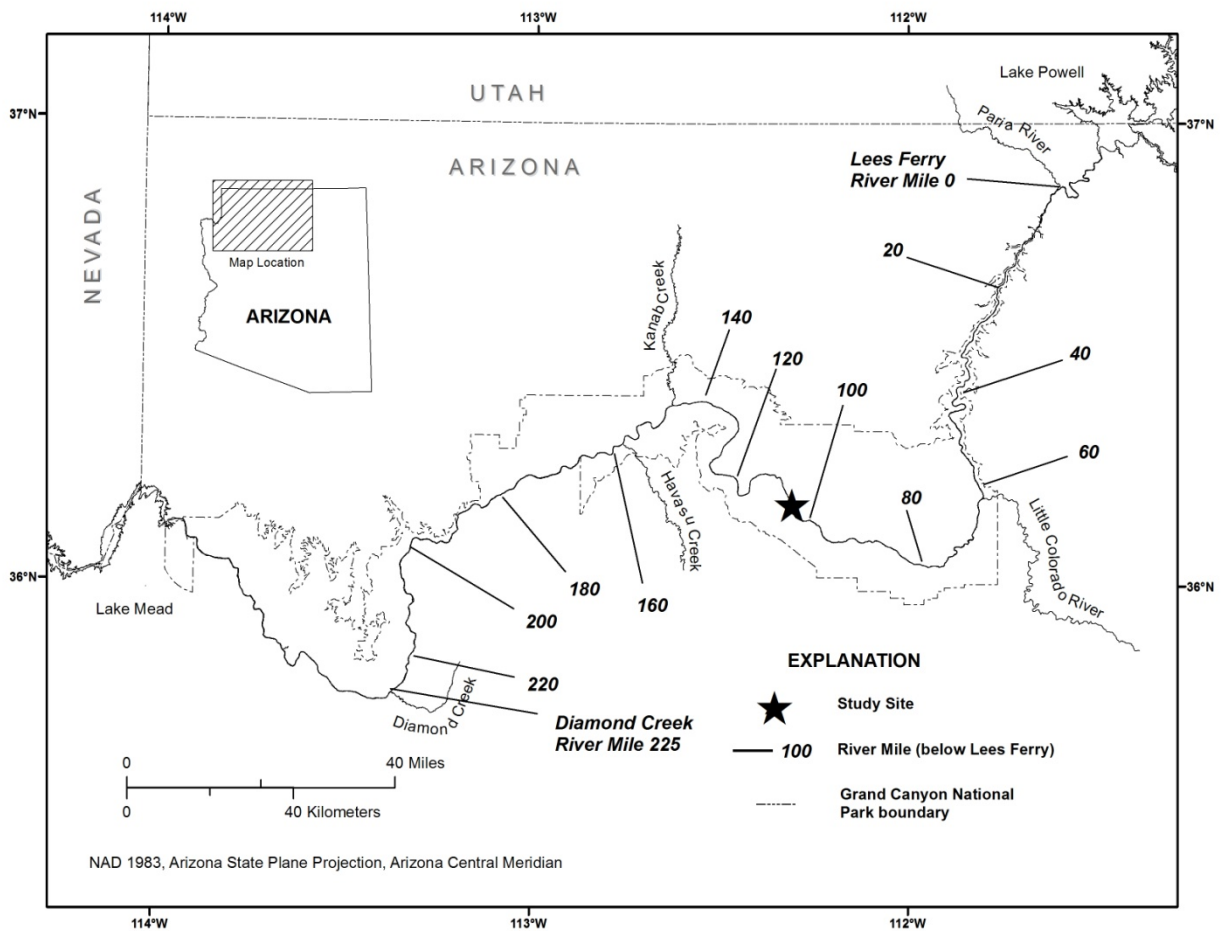


Figure A84. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 104 Mile camp study site (River Mile 104.4R).

Table A23. Campsite area in different stage-elevation zones at 104 Mile camp (River Mile 104.4R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	0	95	34	0	129	129
10/9/1999		0	0	3	64	32	0	99	99
10/22/2000	6	23	27	44	68	26	50	138	188
10/13/2001	0	0	22	40	106	14	22	160	182
9/30/2002	5	45	29	31	100	9	74	140	214
5/5/2003	0	0	0	0	53	12	0	65	65
9/29/2003	8	12	0	0	71	10	12	81	93
5/16/2005	4	52	0	0	67	14	52	81	133
10/17/2006	0	0	0	0	44	11	0	55	55
10/22/2007	0	17	0	0	77	9	17	86	103
2/12/2008	0	0	0	1	59	10	0	70	70
4/17/2008	0	5	1	0	93	14	6	107	113
10/20/2008	0	0	0	0	67	9	0	76	76
10/18/2009	3	3	0	0	75	11	3	86	89
10/13/2011		0	26	0	56	6	26	63	88
10/12/2012	6	1	0	0	72	11	1	83	84

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

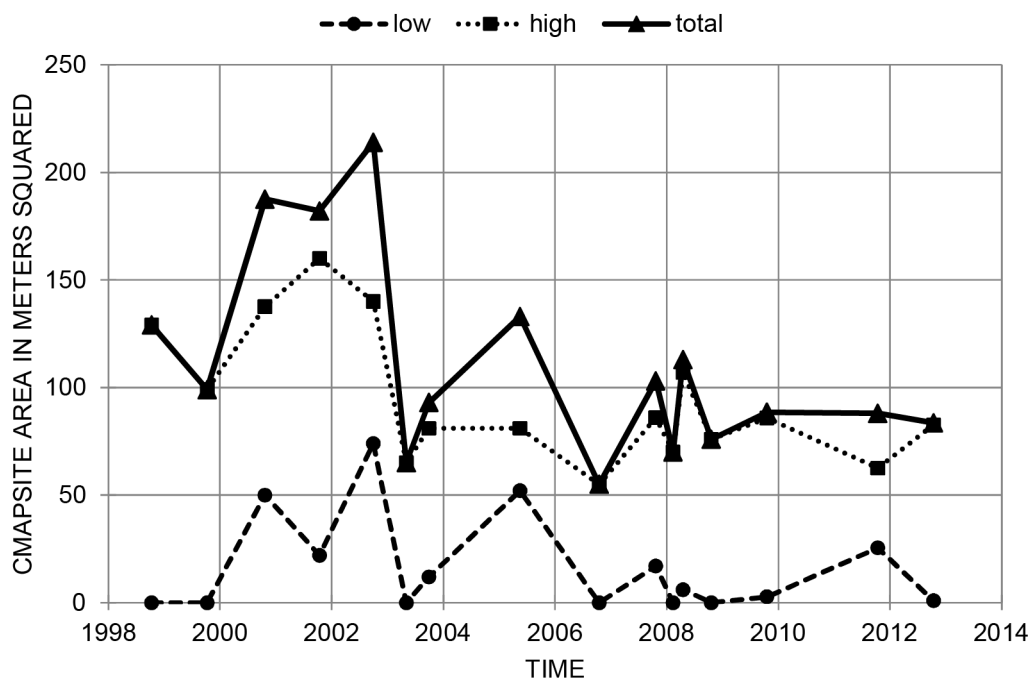
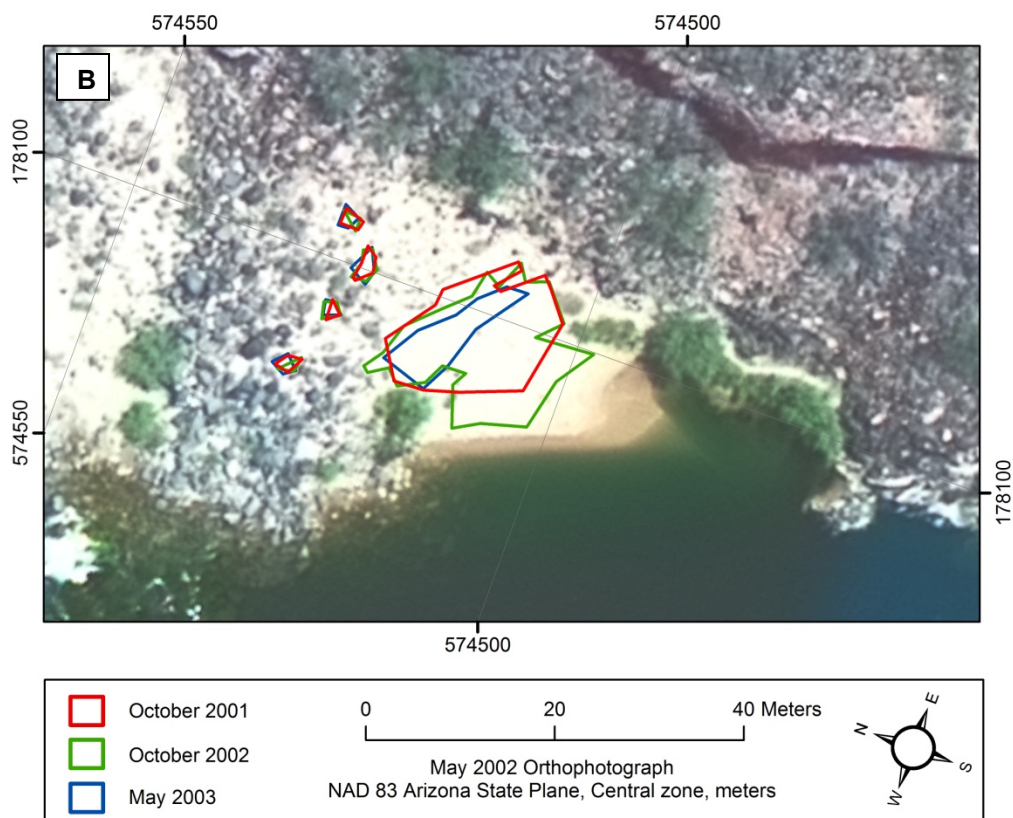
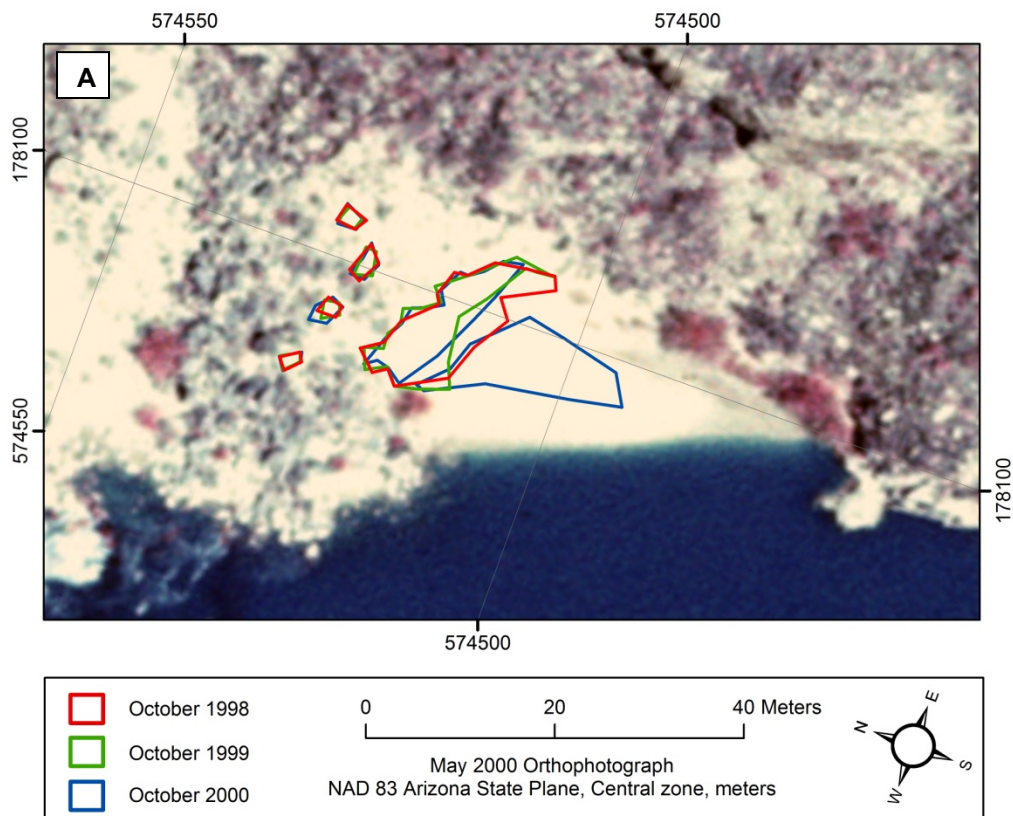
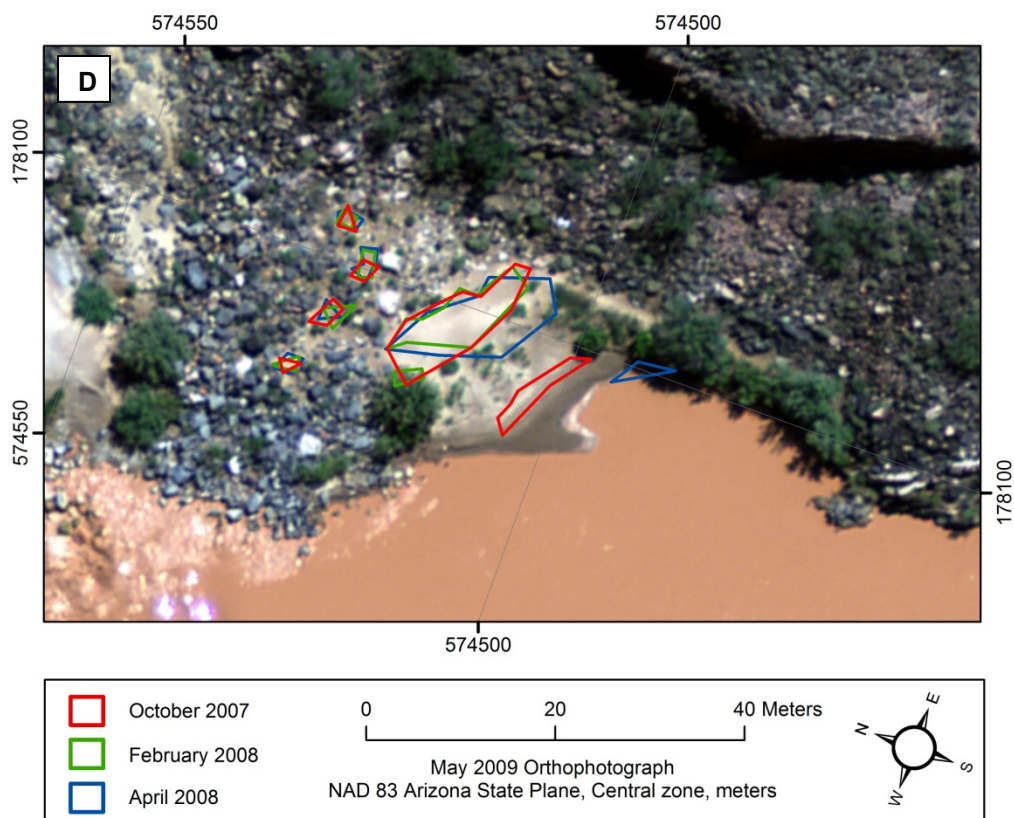
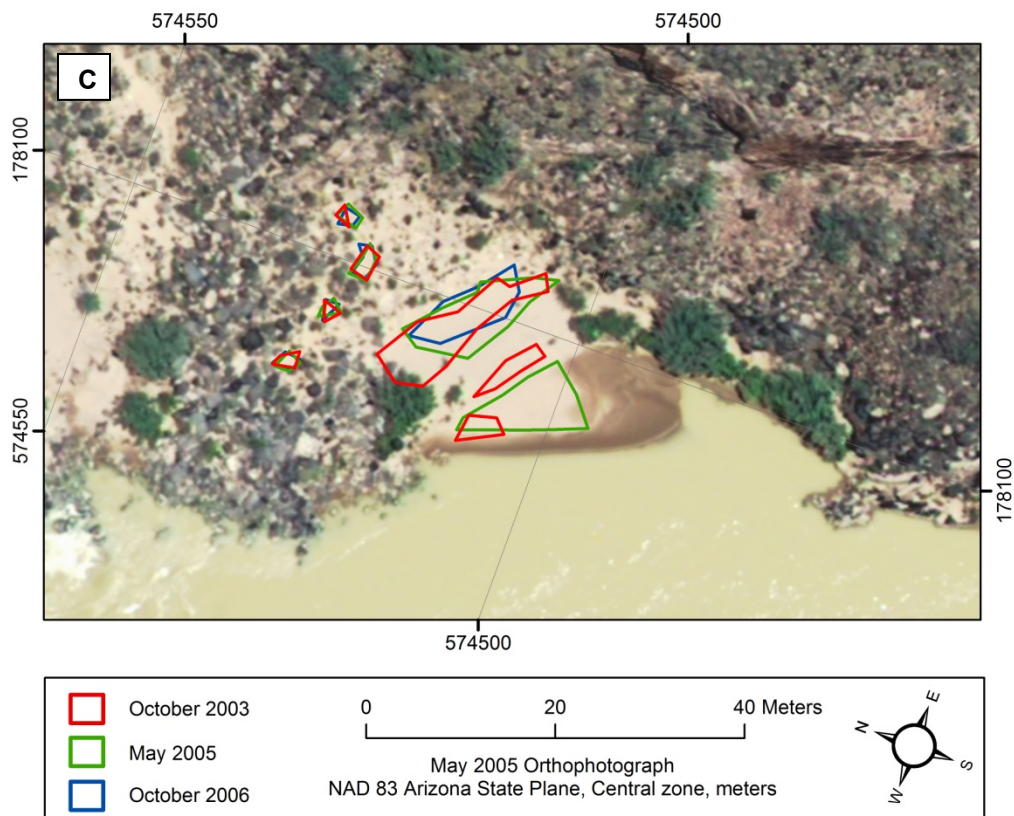


Figure A85. Time series plot of campsite area at 104 Mile camp (River Mile 104.4R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A23 for data.





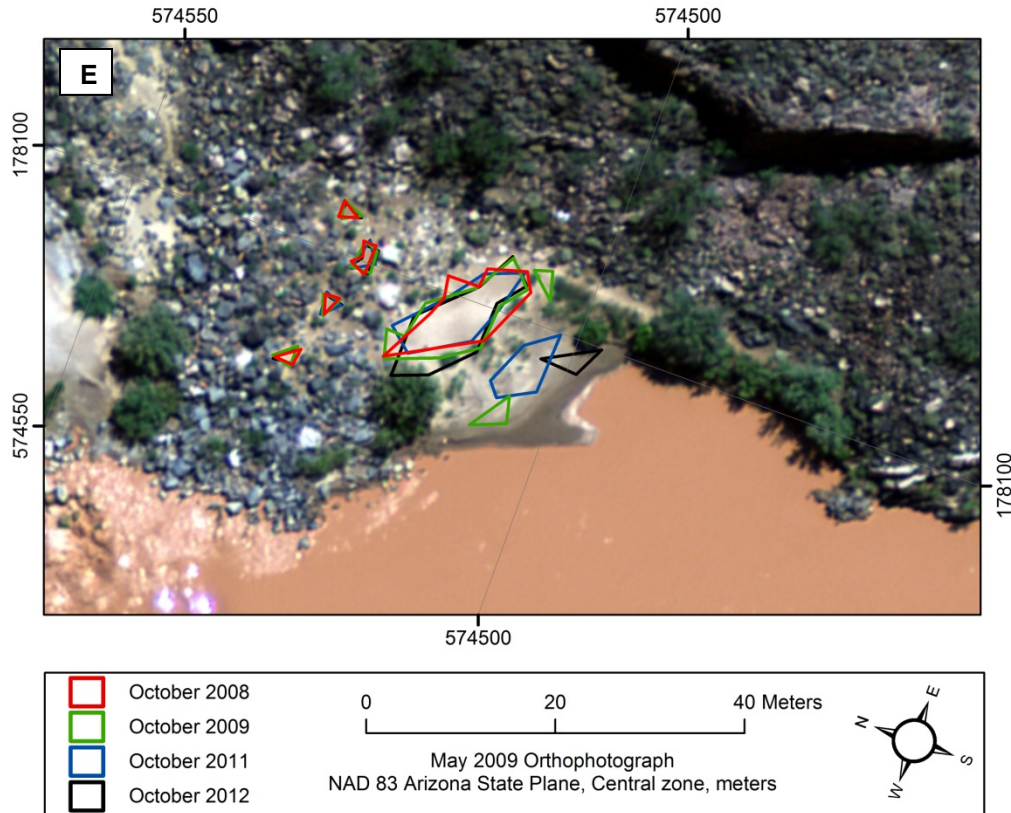


Figure A86. Maps showing campsite areas measured at 104 Mile camp (River Mile 104.4R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A87. Remote camera photographs of 104 Mile camp located at River Mile 104.4R. Flow in main channel is from right to Left. (A) Photograph taken on May 27, 1998; (B) Photograph taken on October 12, 2012.

Campsite Name: 119 Mile

River Mile: 119.4, River Right

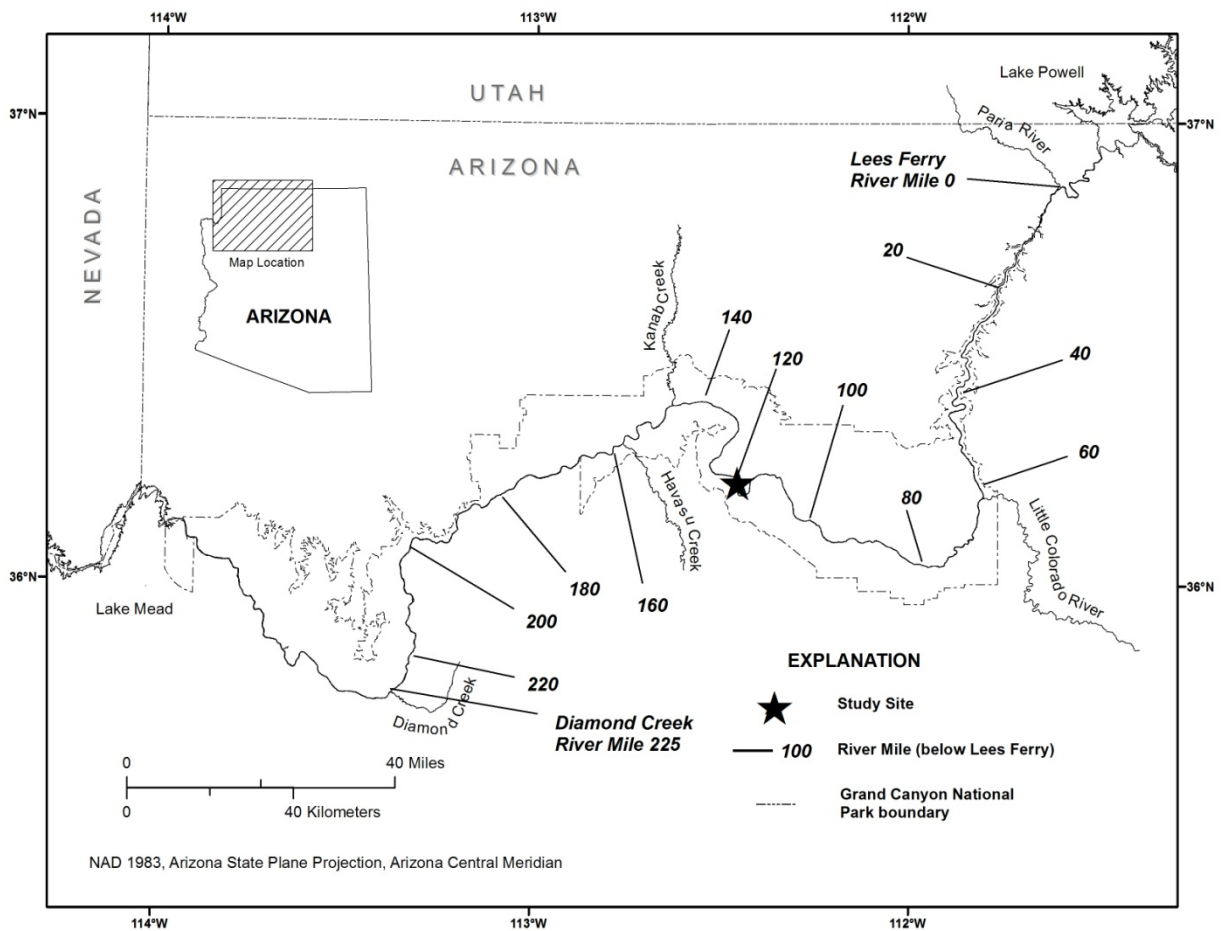


Figure A88. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 119 Mile camp study site (River Mile 119.4R).

Table A24. Campsite area in different stage-elevation zones at 119 Mile camp (River Mile 119.4R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		14	127	35	77	188	141	300	441
10/10/1999		0	148	18	73	204	148	295	443
10/22/2000		434	773	360	53	191	1207	604	1811
10/13/2001	193	26	46	158	30	156	72	344	416
10/1/2002	509	133	0	0	24	145	133	169	302
5/6/2003	93	750	18	0	31	143	768	174	942
10/1/2003	400	632	0	0	26	140	632	166	798
5/16/2005	4	188	132	31	520	133	320	684	1004
10/17/2006	240	120	0	0	27	129	120	156	276
10/23/2007	276	193	0	0	26	136	193	162	355
2/12/2008	428	36	0	0	14	123	36	137	173
4/8/2008	0	221	170	69	151	119	391	339	730
10/21/2008	0	132	0	0	42	83	132	125	257
10/19/2009	525	0	0	0	24	102	0	126	126
10/14/2011		5	772	49	0	54	777	102	879
10/12/2012	673	95	0	0	2	96	95	98	193

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

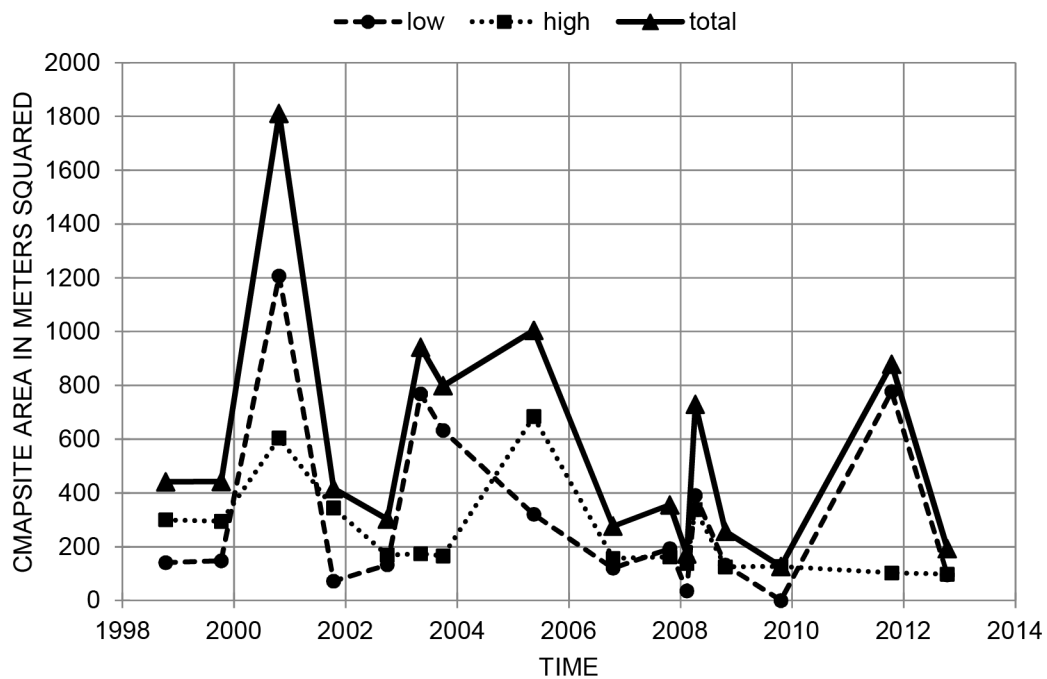
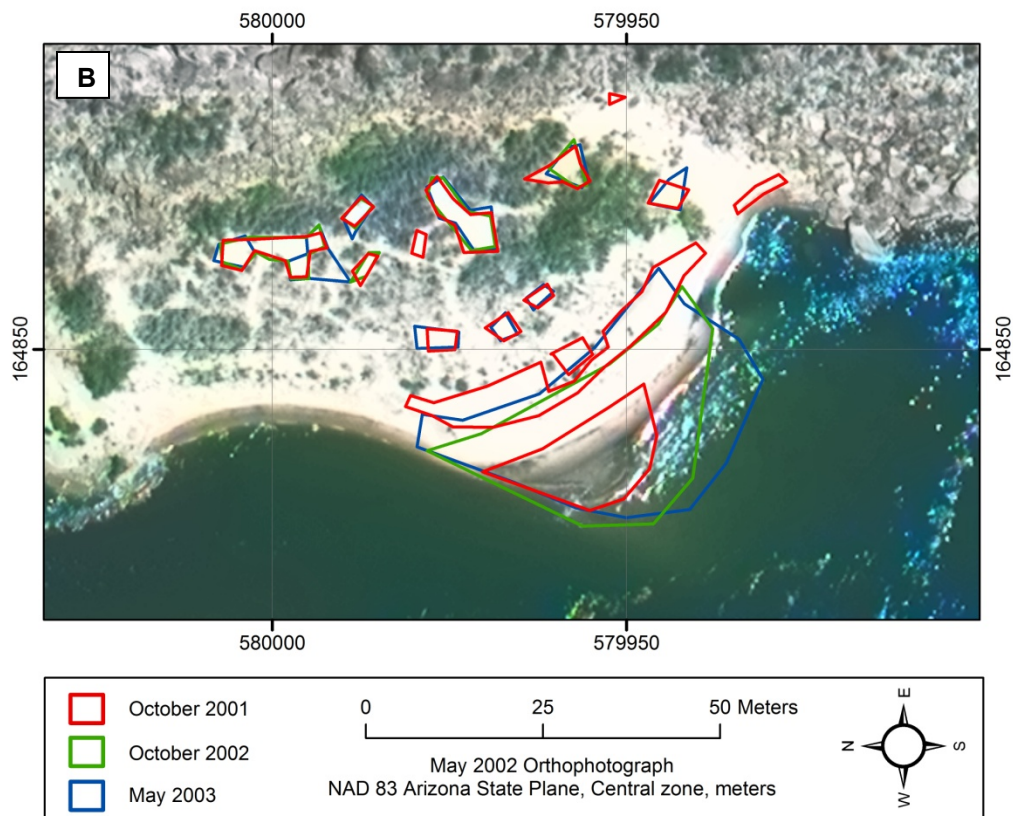
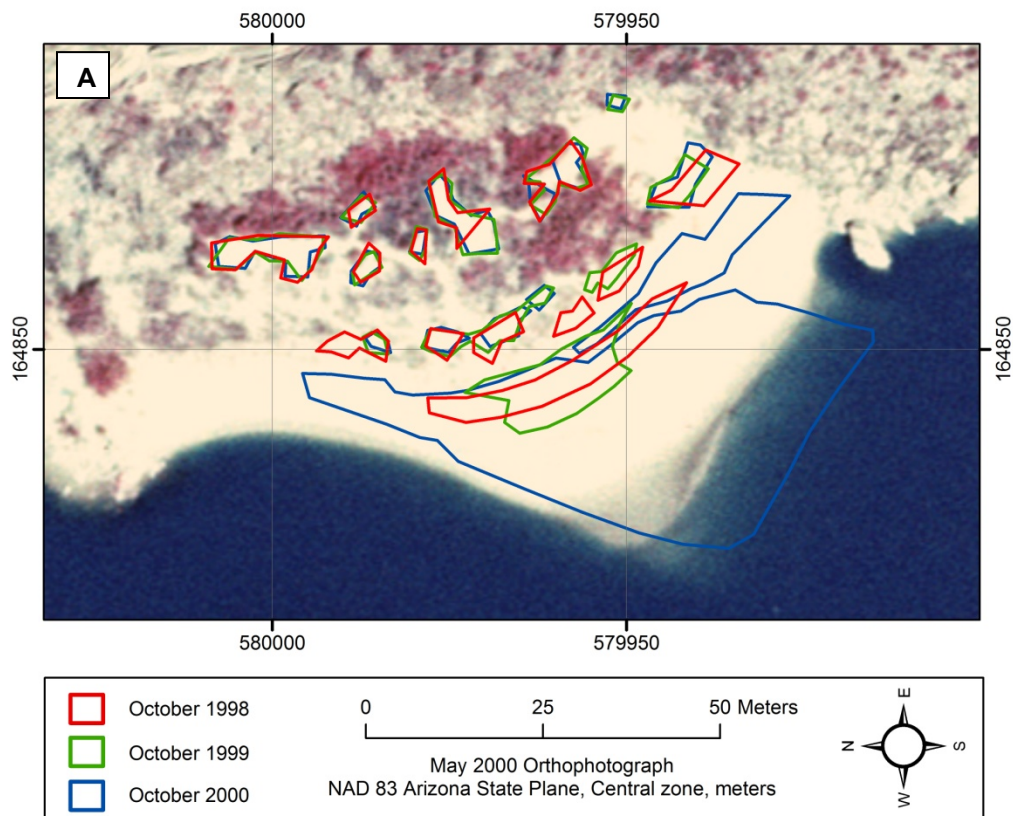
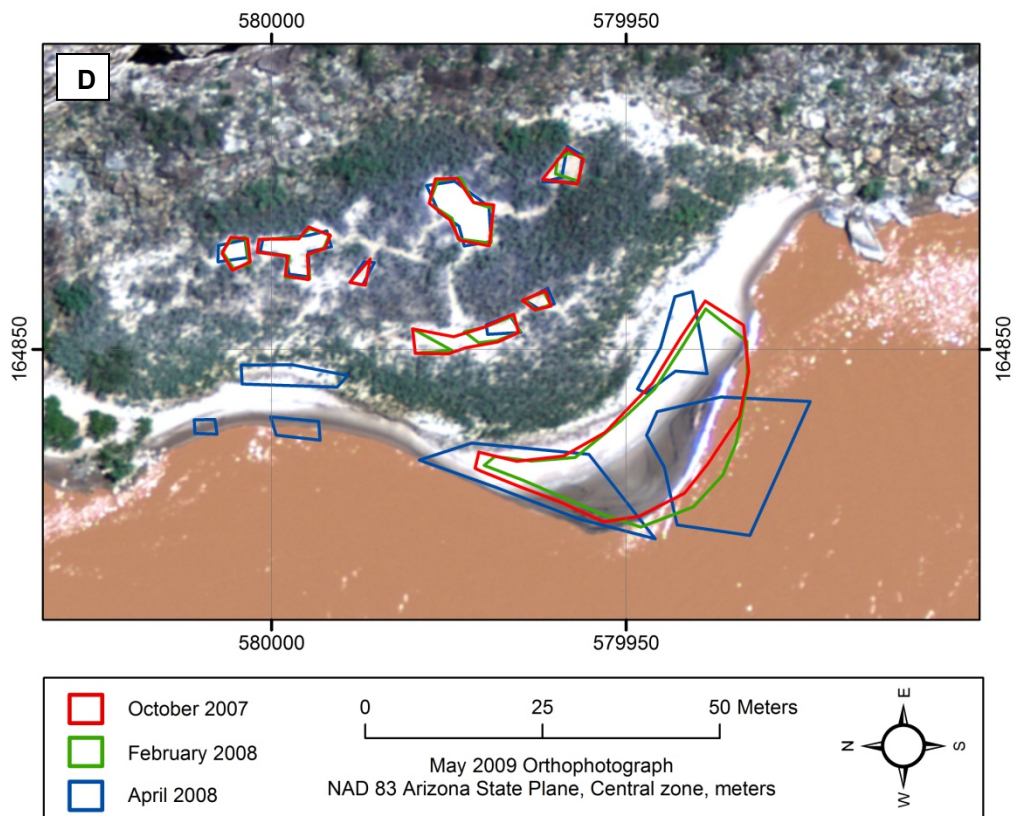
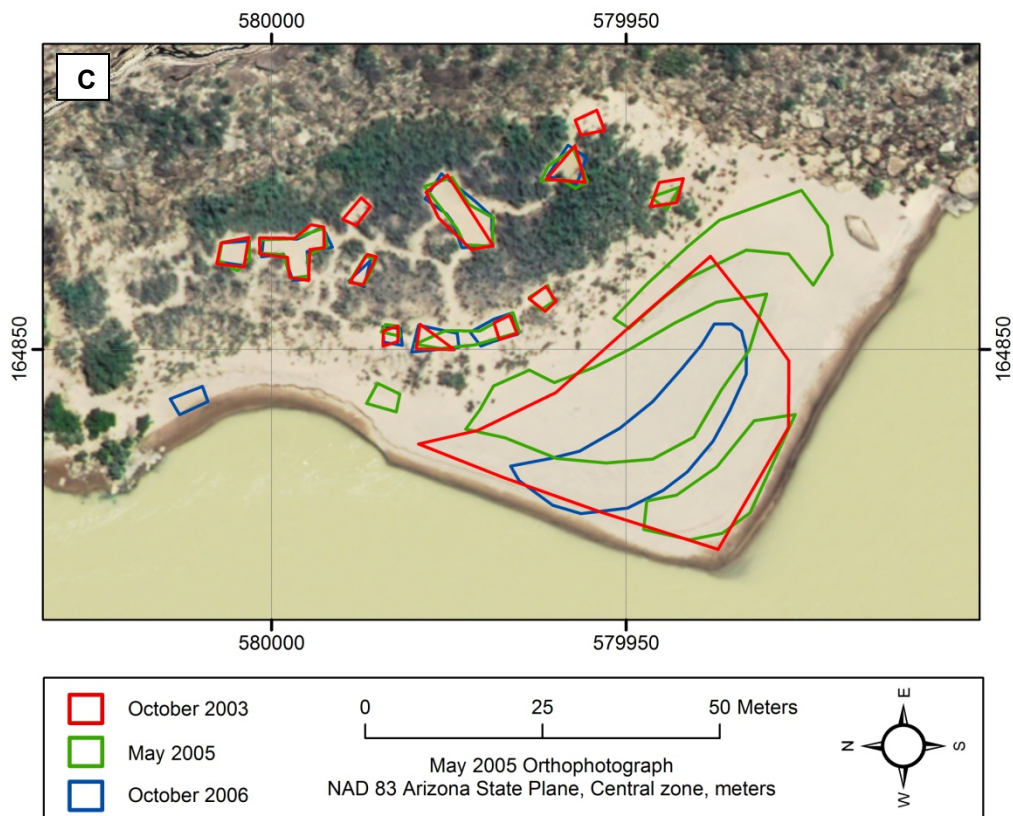


Figure A89. Time series plot of campsite area at 119 Mile camp (River Mile 119.4R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A24 for data.





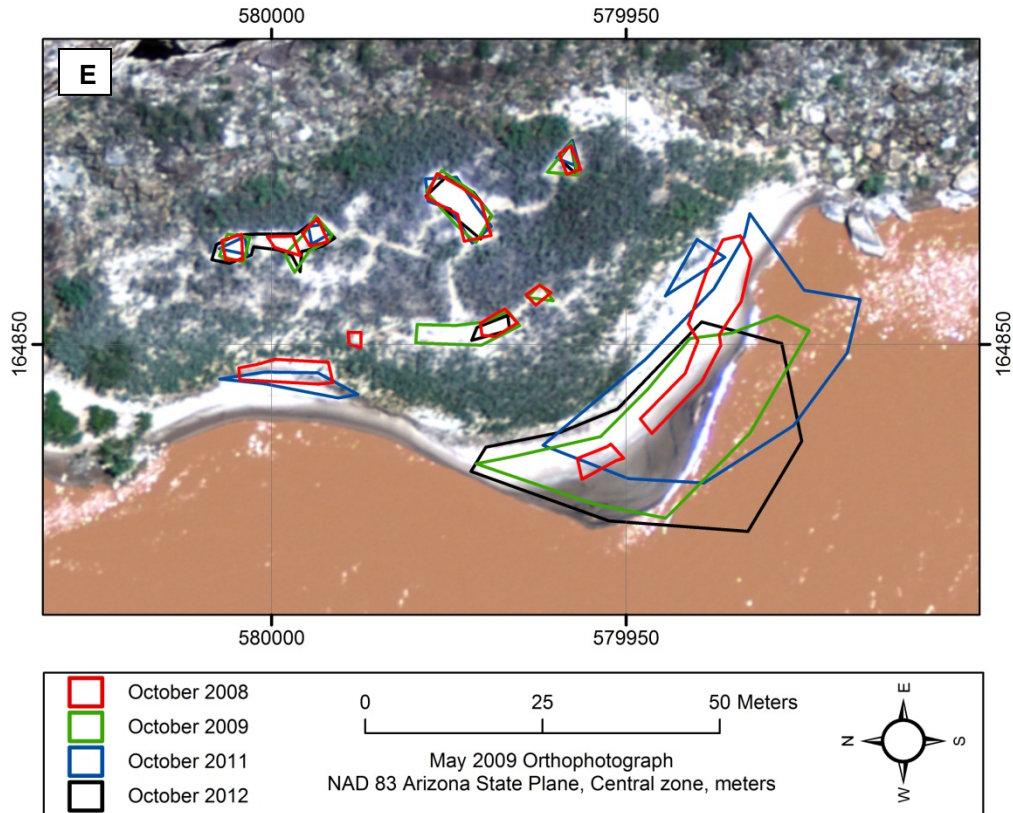


Figure A90. Maps showing campsite areas measured at 119 Mile camp (River Mile 119.4R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A91. Remote camera photographs of 119 Mile camp located at River Mile 119.4R. Flow in main channel is from right to left. (A) Photograph taken on October 4, 1998; (B) Photograph taken on October 5, 2012.

Campsite Name: 122 Mile

River Mile: 122.8, River Right

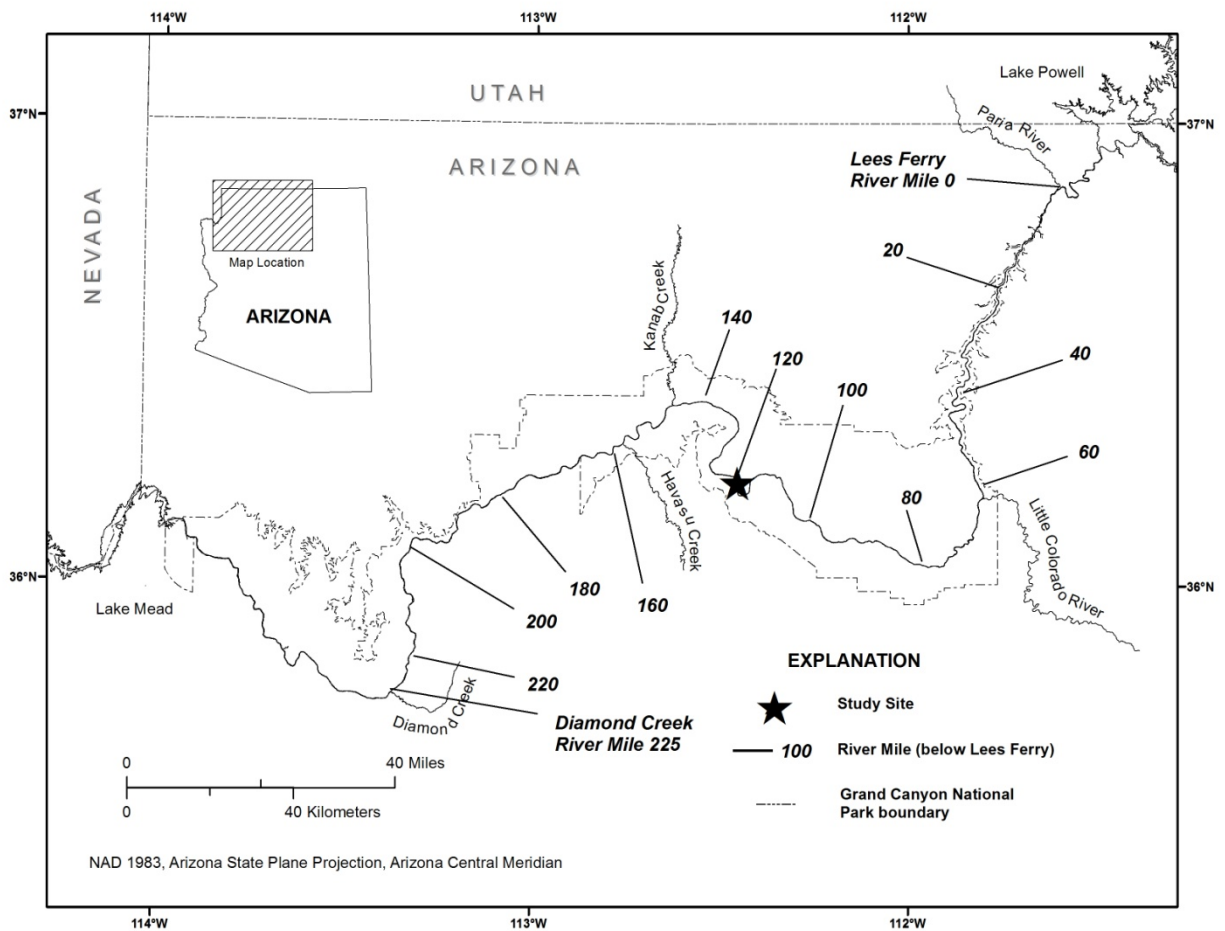


Figure A92. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 122 Mile camp study site (River Mile 122.8R).

Table A25. Campsite area in different stage-elevation zones at 122 Mile camp (River Mile 122.8R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		20	354	50	370	33	374	453	827
10/10/1999		0	16	139	316	0	16	455	471
10/22/2000	1088	675	257	24	266	3	932	293	1225
10/14/2001	586	612	97	1	218	3	709	222	931
10/1/2002	1137	264	22	59	214	1	286	274	560
5/6/2003	0	406	14	78	218	3	420	299	719
10/1/2003	925	821	103	93	262	6	924	361	1285
5/17/2005	296	1102	38	2	145	0	1140	147	1287
10/17/2006	0	261	130	0	171	1	391	172	563
10/23/2007	338	560	53	0	163	0	613	163	776
2/13/2008	0	121	87	0	98	0	208	98	306
4/8/2008	67	169	130	350	307	0	299	657	956
10/21/2008	0	9	83	397	322	0	92	719	811
10/19/2009	986	17	73	333	396	2	90	730	820
10/14/2011		178	478	133	230	0	656	363	1019
10/12/2012	983	242	132	186	174	0	373	360	733

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

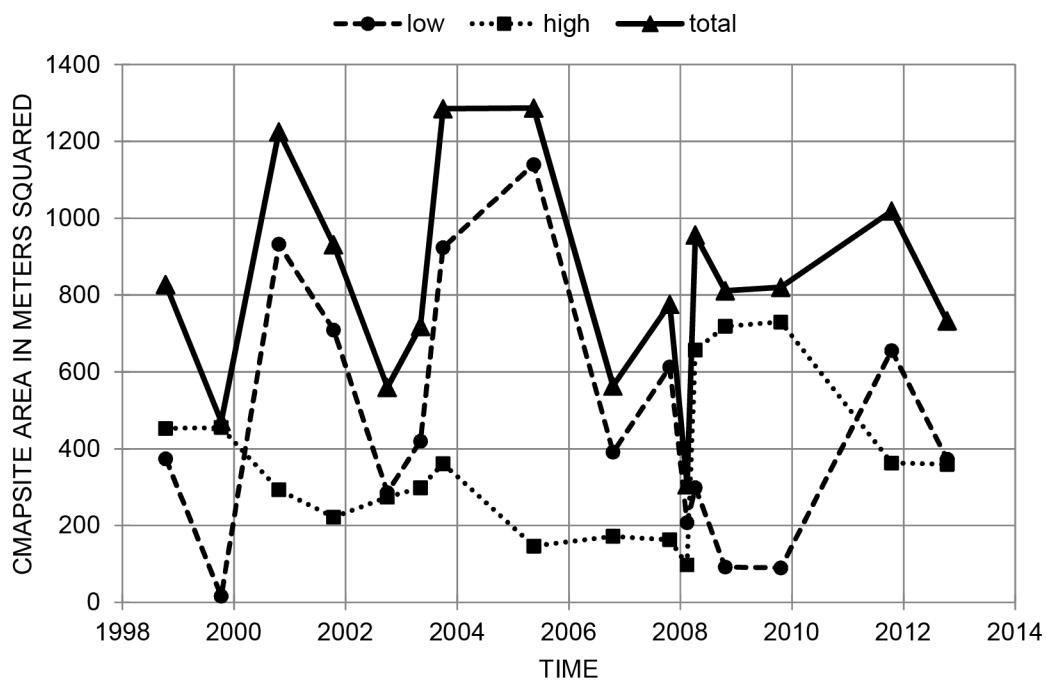
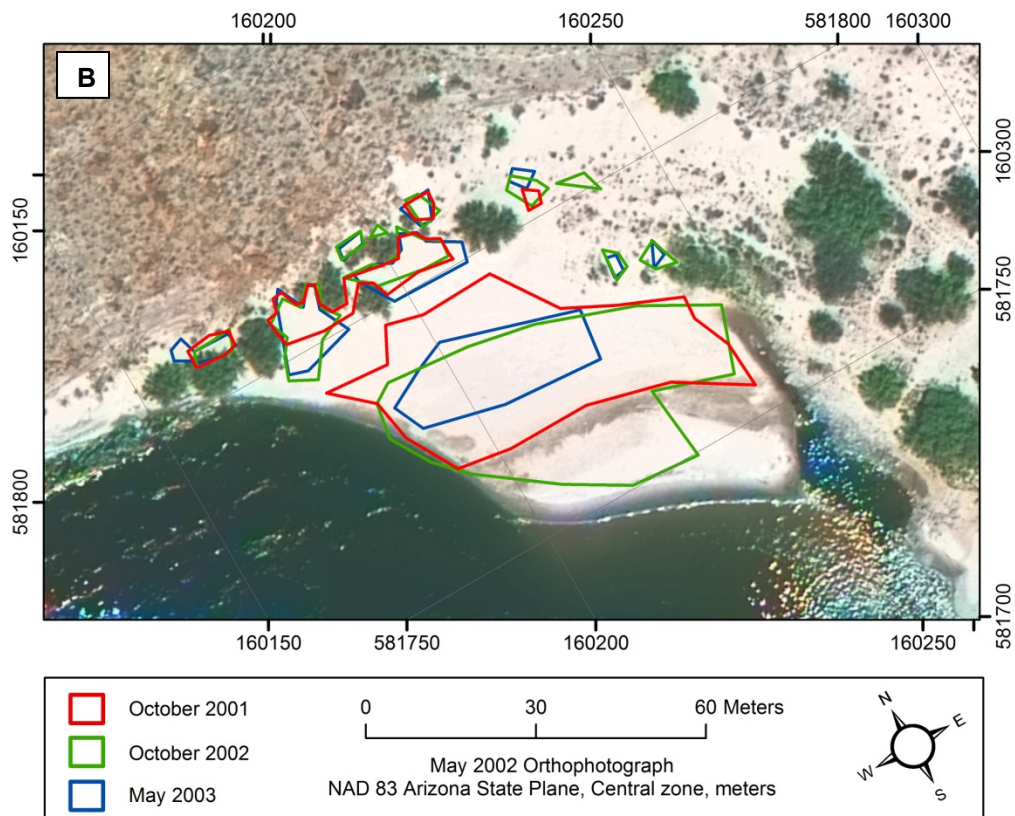
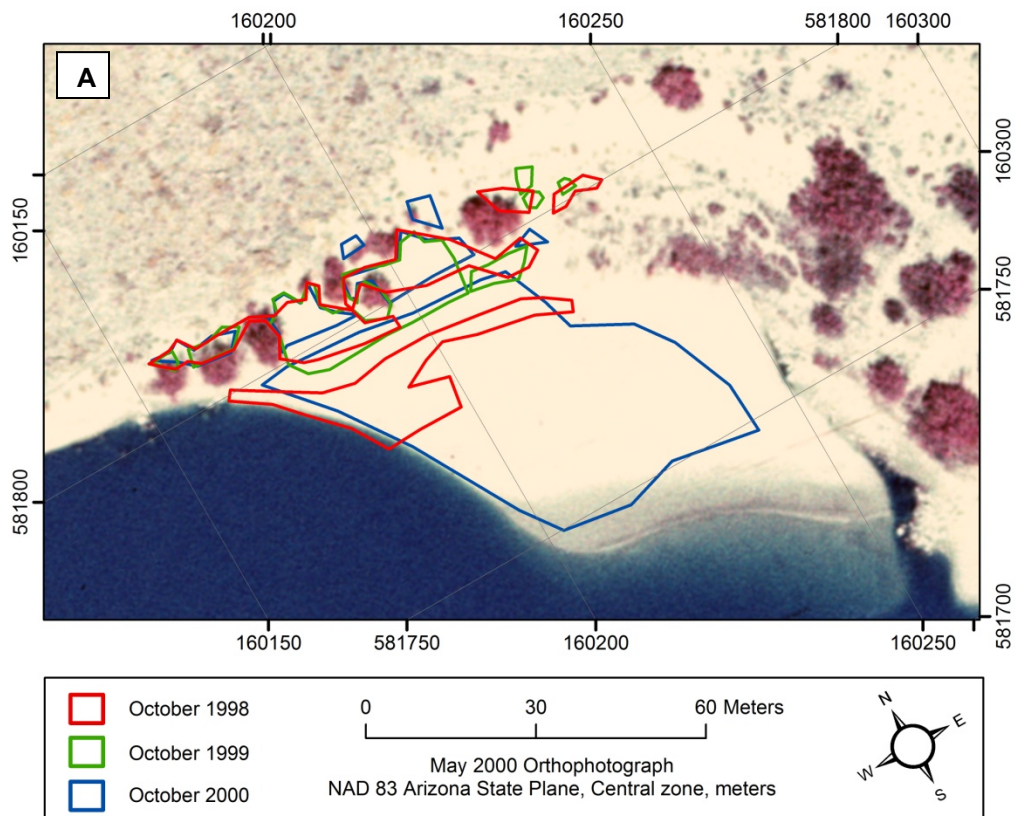
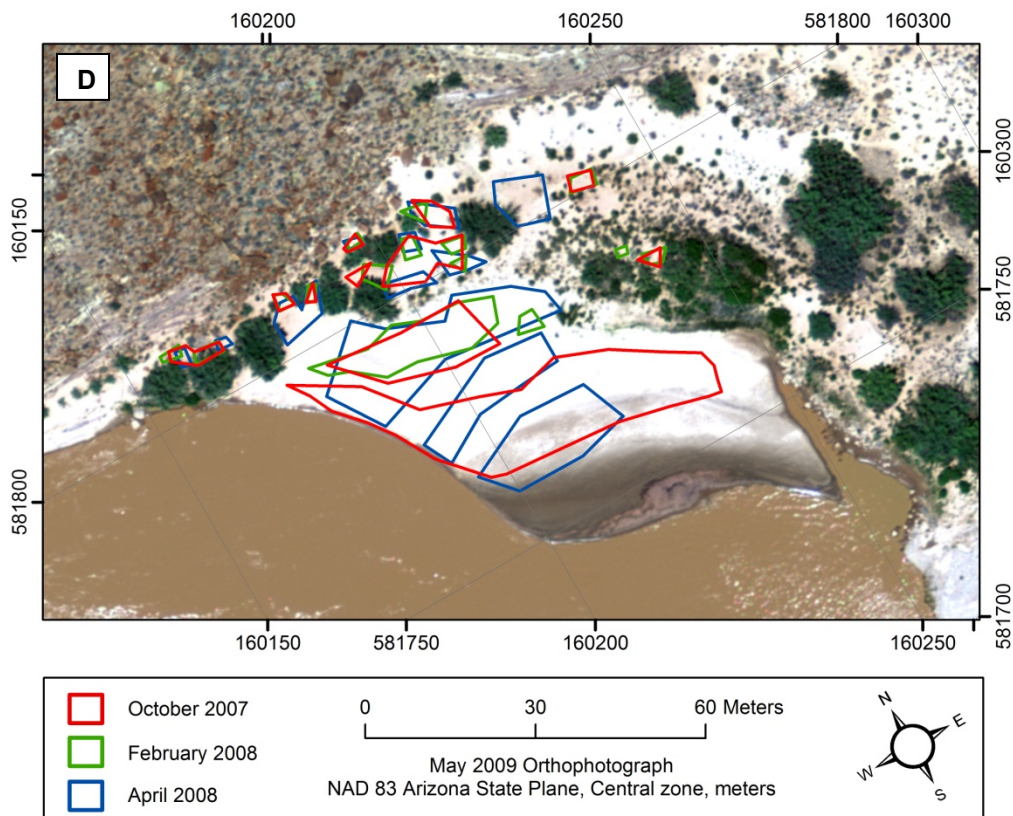
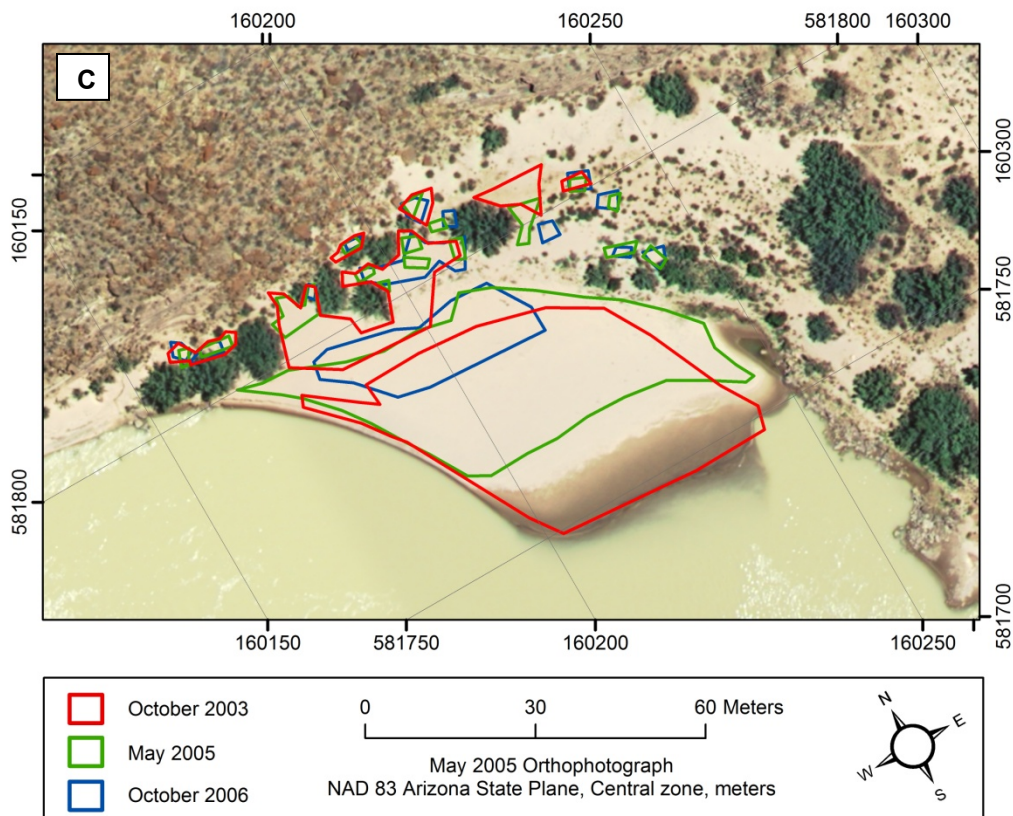


Figure A93. Time series plot of campsite area at 122 Mile camp (River Mile 122.8R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A25 for data.





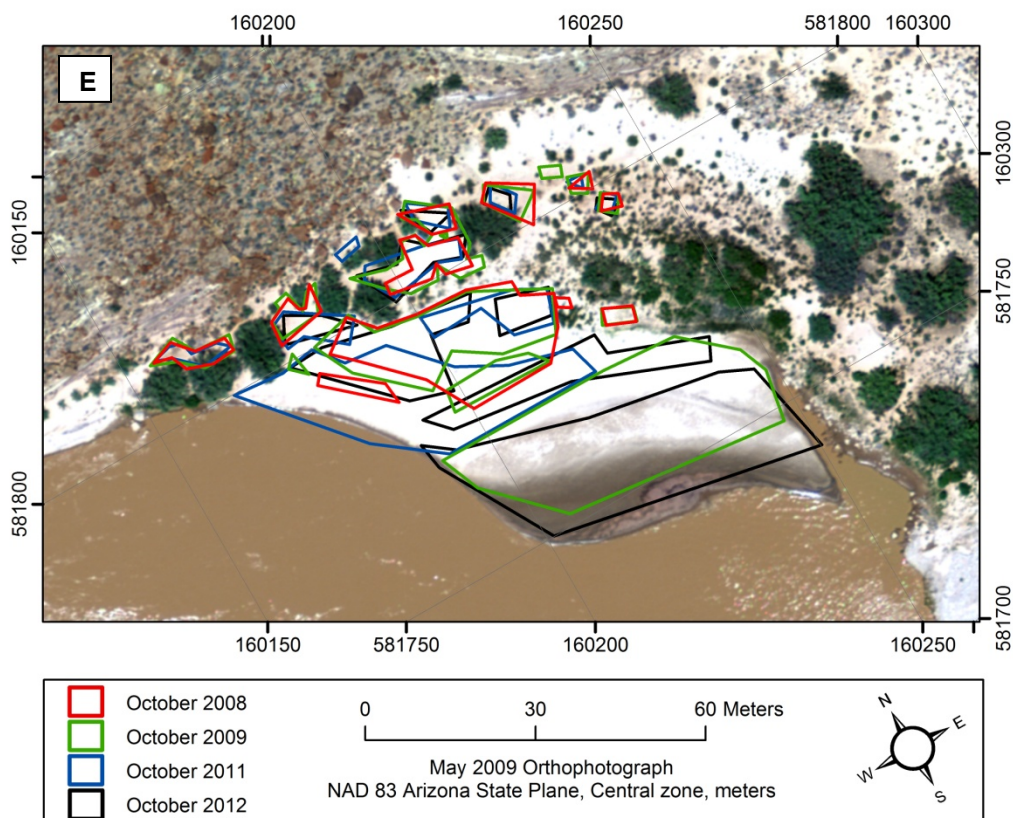


Figure A94. Maps showing campsite areas measured at 122 Mile camp (River Mile 122.8R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A95. Remote camera photographs showing 122 Mile camp located at River Mile 122.8R. Flow in main channel is from right to left. (A) Photograph taken on October 20, 1998; (B) Photograph taken on October 9, 2012.

Campsite Name: Forster

River Mile: 123.2, River Left

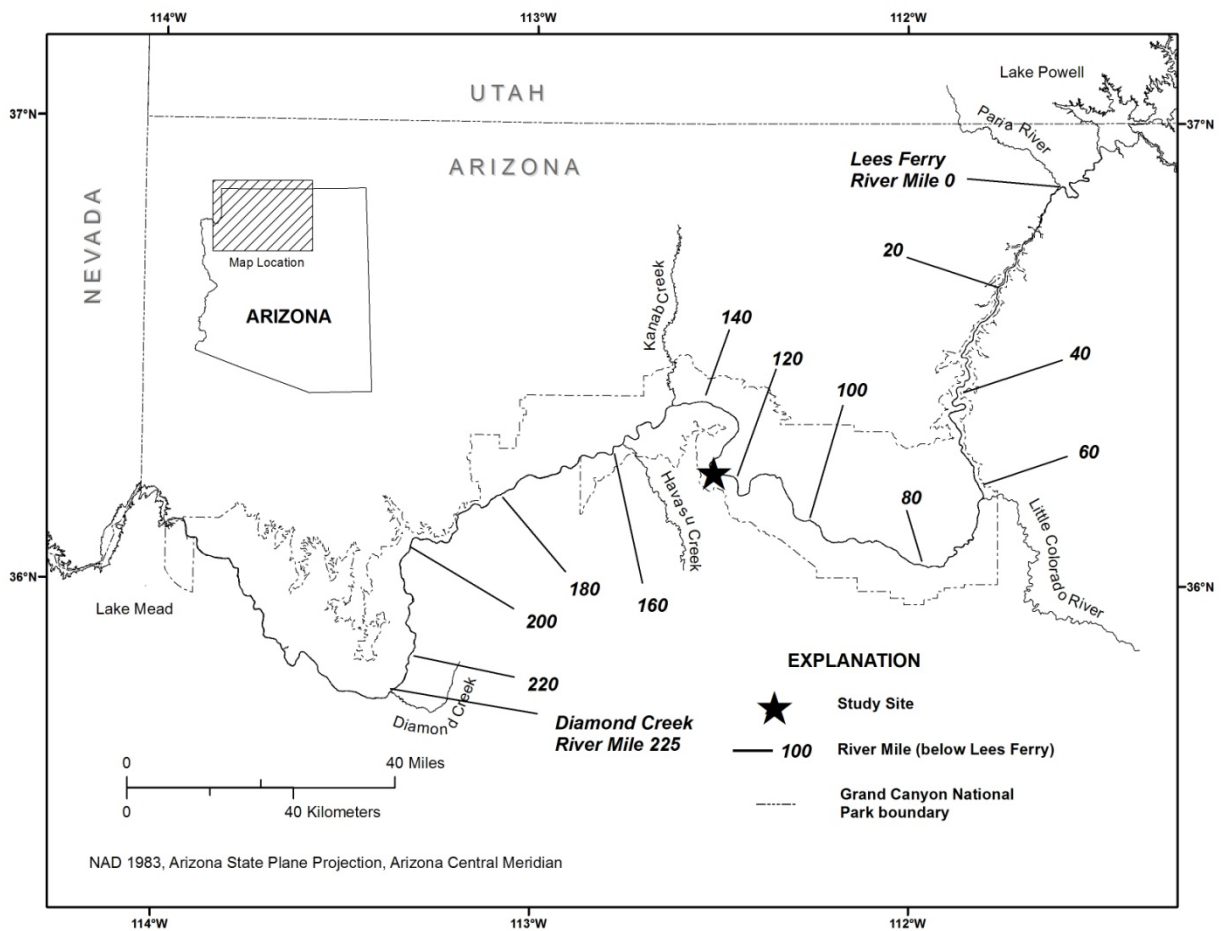


Figure A96. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Forster camp study site (River Mile 123.2L).

Table A26. Campsite area in different stage-elevation zones at Forster camp (River Mile 123.2L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/18/1998		0	297	0	0	250	297	250	547
10/10/1999		0	61	0	0	240	61	240	301
10/22/2000	0	0	28	82	0	146	28	228	256
10/14/2001	243	0	8	68	9	109	8	186	194
10/1/2002	59	204	22	12	6	88	226	106	332
5/6/2003	2	274	24	0	0	75	298	75	373
10/1/2003	130	475	24	7	2	26	499	35	534
5/17/2005	0	0	0	0	66	48	0	114	114
10/17/2006	0	0	0	0	18	138	0	156	156
10/23/2007	0	289	0	0	0	21	289	21	310
2/13/2008	0	187	0	0	16	158	187	174	361
4/8/2008	0	0	0	0	58	92	0	150	150
10/21/2008	11	189	0	0	0	89	189	89	278
10/19/2009	278	1	0	0	0	52	1	52	53
10/14/2011		33	221	0	0	57	254	57	312
10/12/2012	283	294	37	0	0	28	331	28	359

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

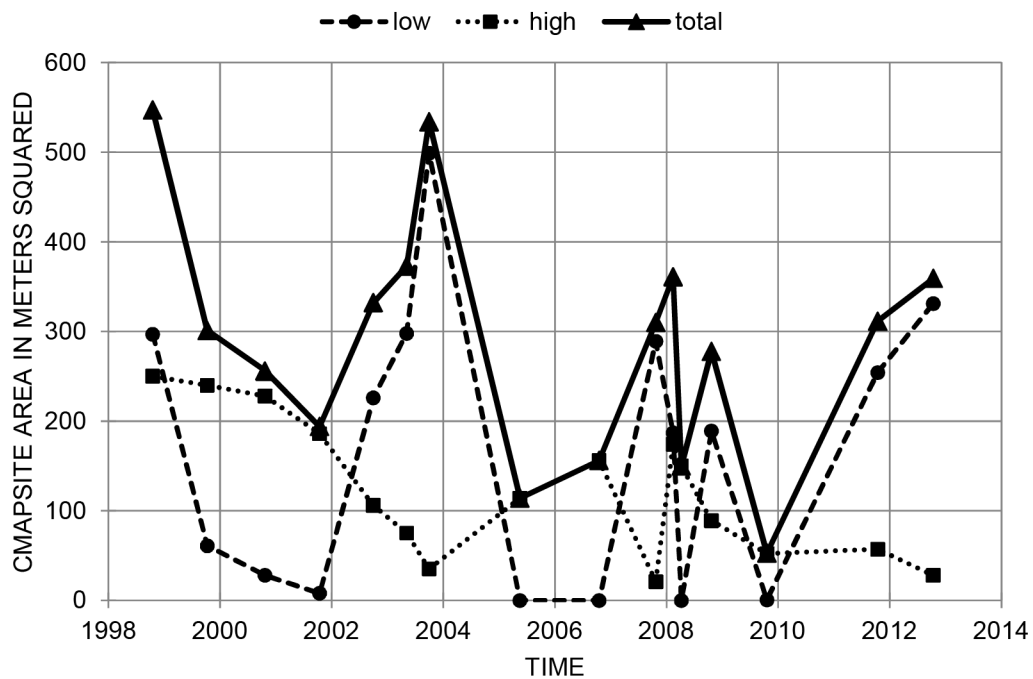
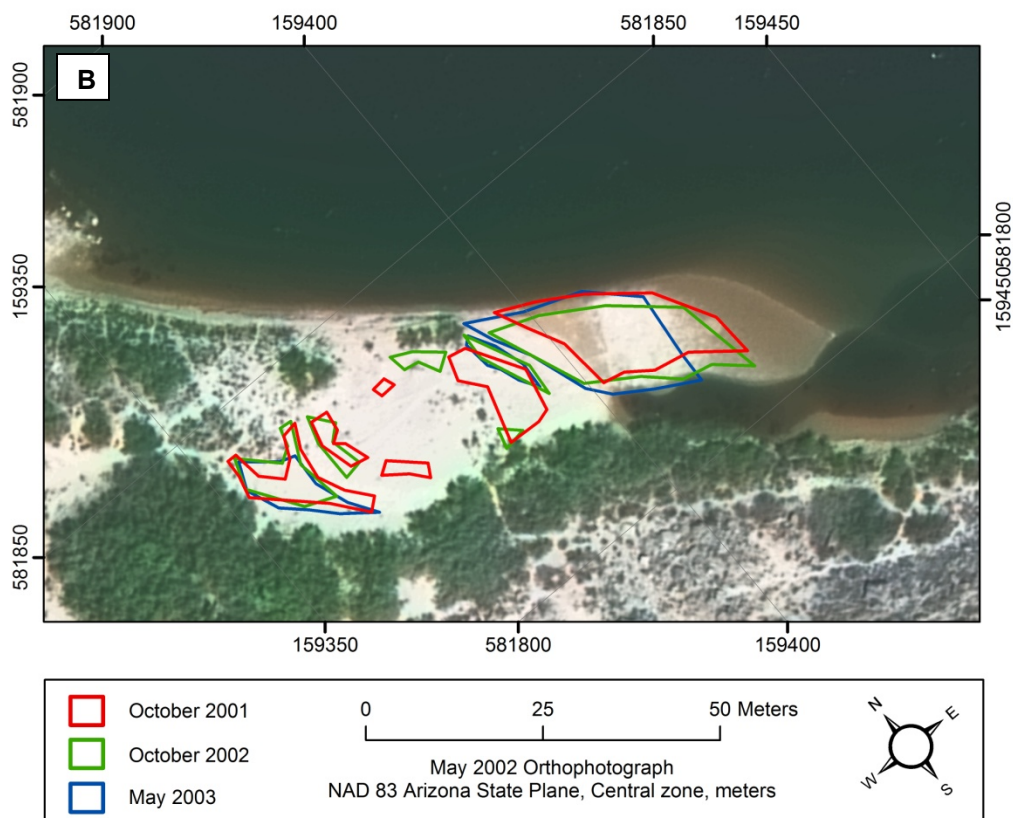
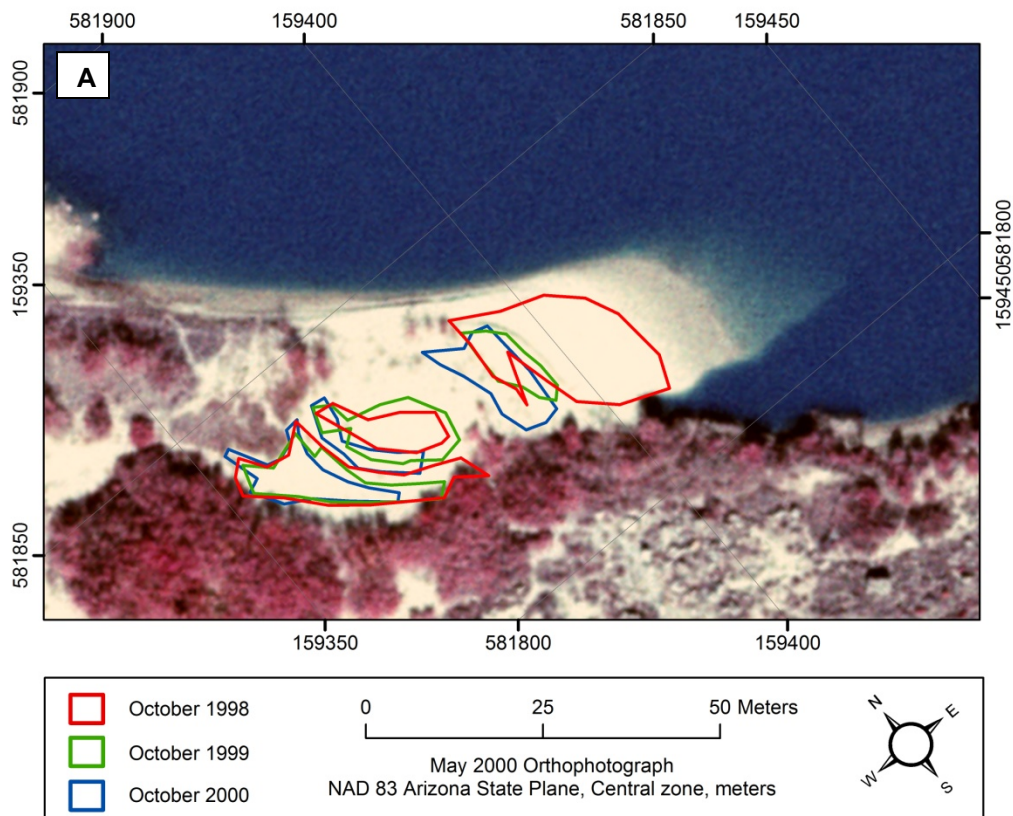
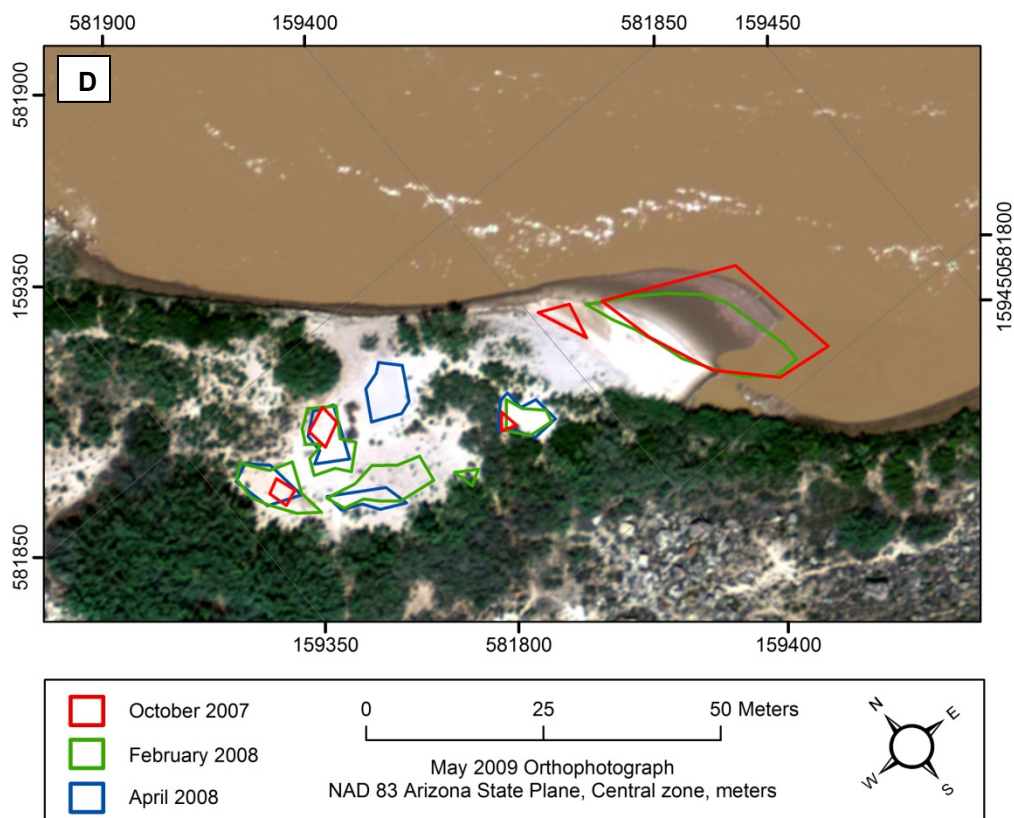
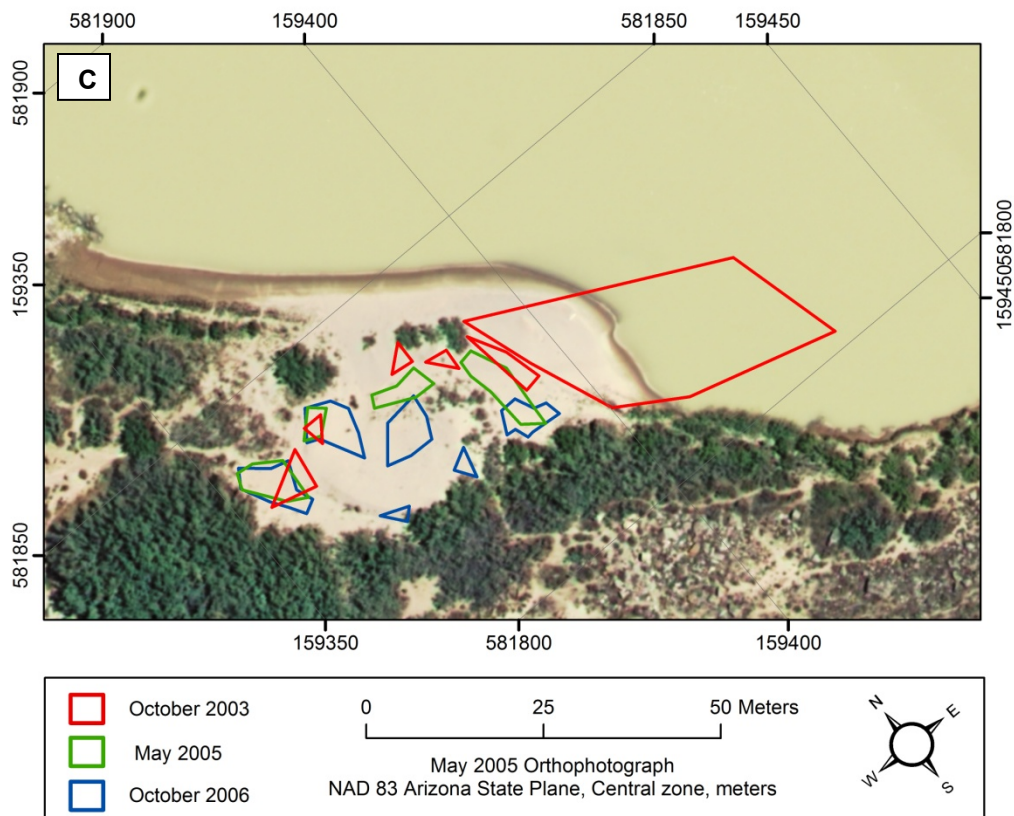


Figure A97. Time series plot of campsite area at Forster camp (River Mile 123.2L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A26 for data.





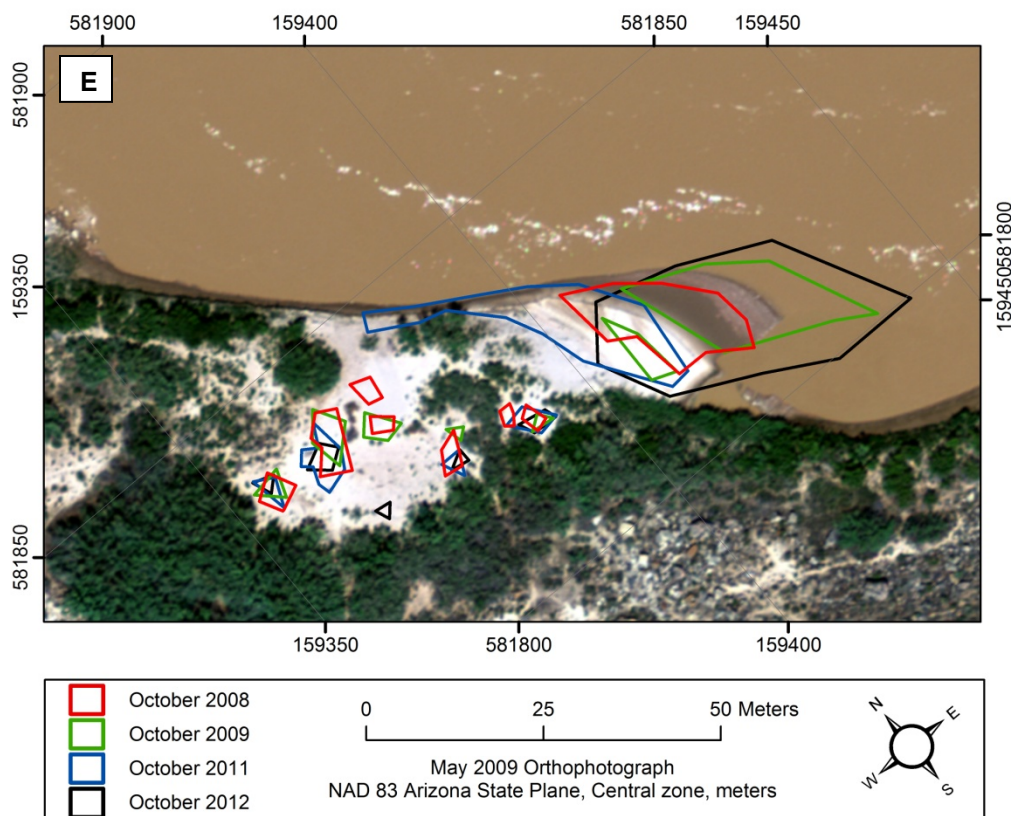


Figure A98. Maps showing campsite areas measured at Forster camp (River Mile 123.2L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Note that campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A99. Remote camera photographs of Forster camp located at River Mile 123.2L. Flow in main channel is from left to right. (A) Photograph taken on October 8, 1999; (B) Photograph taken on October 26, 2010.

Campsite Name: Football Field

River Mile: 137.7, River Left

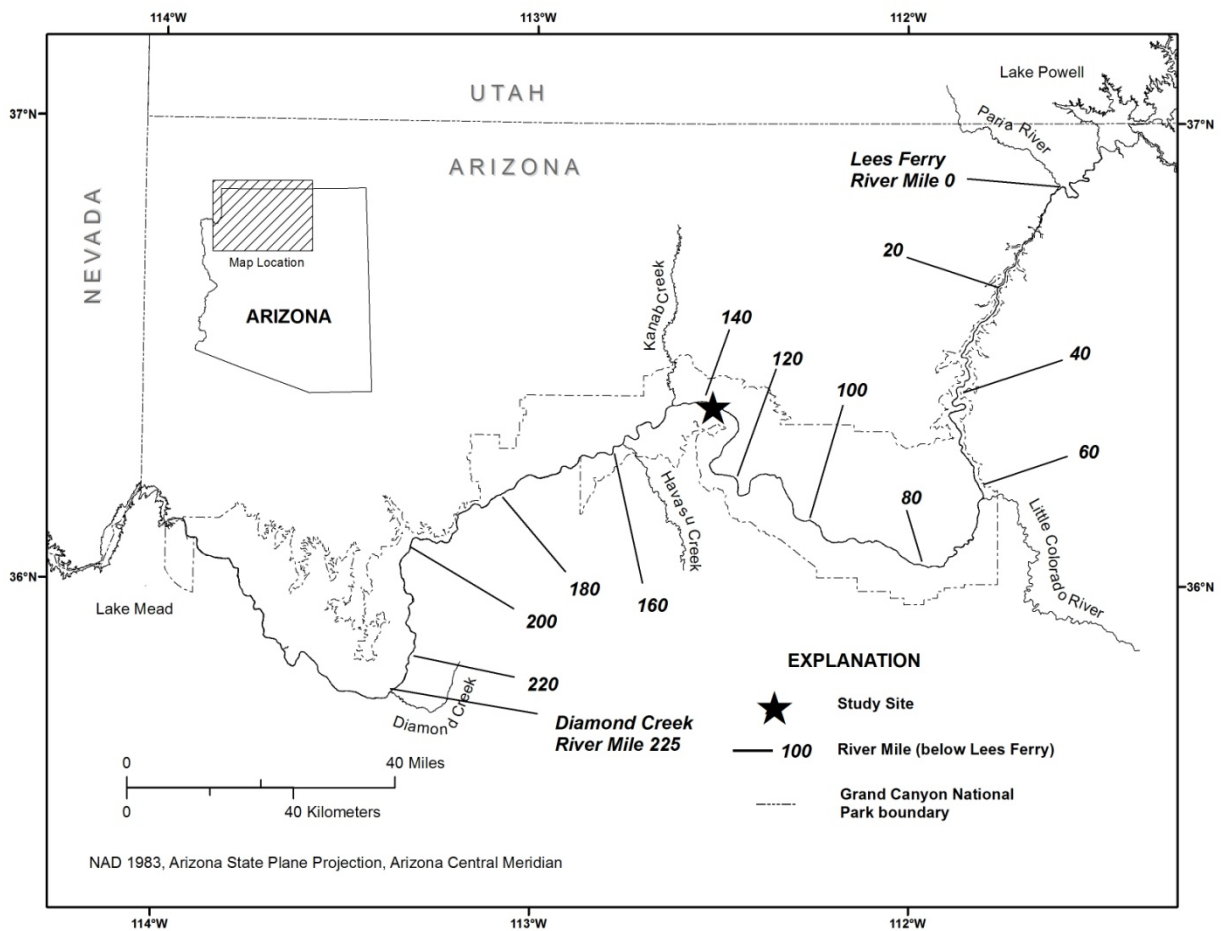


Figure A100. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Football Field camp study site (River Mile 137.7L).

Table A27. Campsite area in different stage-elevation zones at Fottball Field camp (River Mile 137.7L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/18/1998		478	273	3	69	191	751	263	1014
10/10/1999		0	443	6	97	156	443	259	702
10/24/2000	0	0	875	241	71	107	875	419	1294
10/15/2001	787	33	385	173	62	108	418	343	761
10/2/2002	802	114	355	174	228	97	469	499	968
5/8/2003	344	969	286	155	57	78	1255	290	1545
10/1/2003	1063	691	334	100	93	75	1025	268	1293
5/18/2005	28	1547	200	7	239	11	1747	257	2004
10/20/2006	417	554	184	8	225	21	738	254	992
10/24/2007	783	94	57	0	156	9	151	165	316
2/14/2008	338	156	224	19	163	1	380	183	563
4/9/2008	0	84	549	323	255	4	633	582	1215
10/22/2008	590	156	514	113	173	0	670	286	956
10/20/2009	879	0	495	59	144	0	495	202	697
10/15/2011		0	756	2	143	0	756	145	900
10/13/2012	1220	813	436	27	110	1	1249	137	1386

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

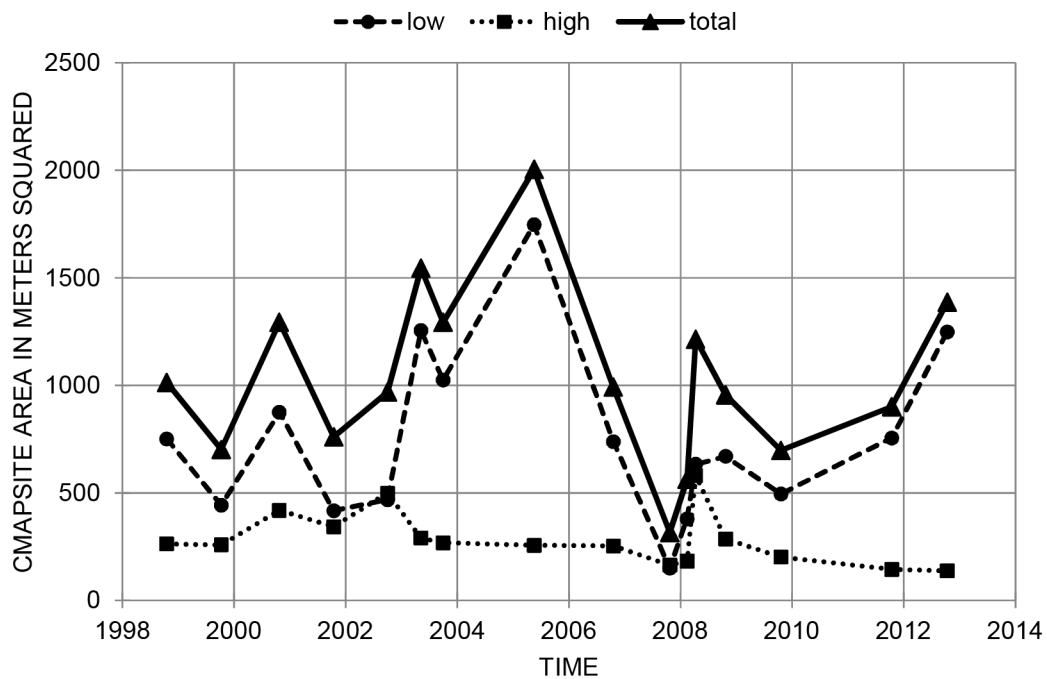
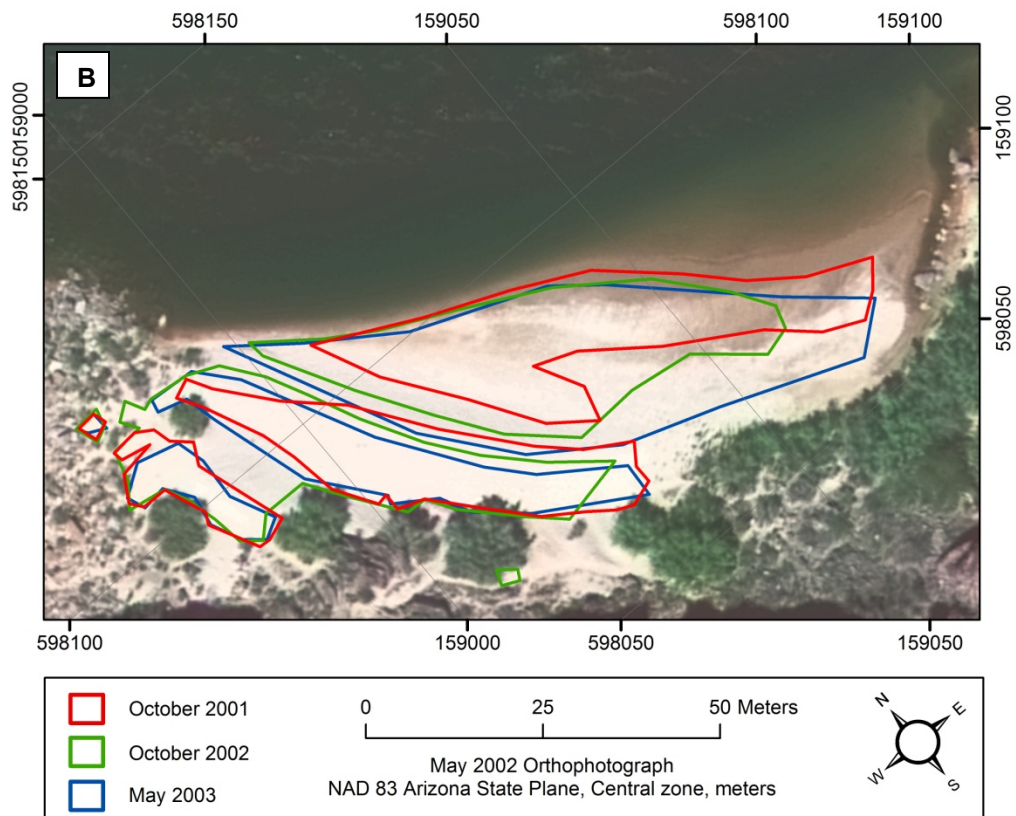
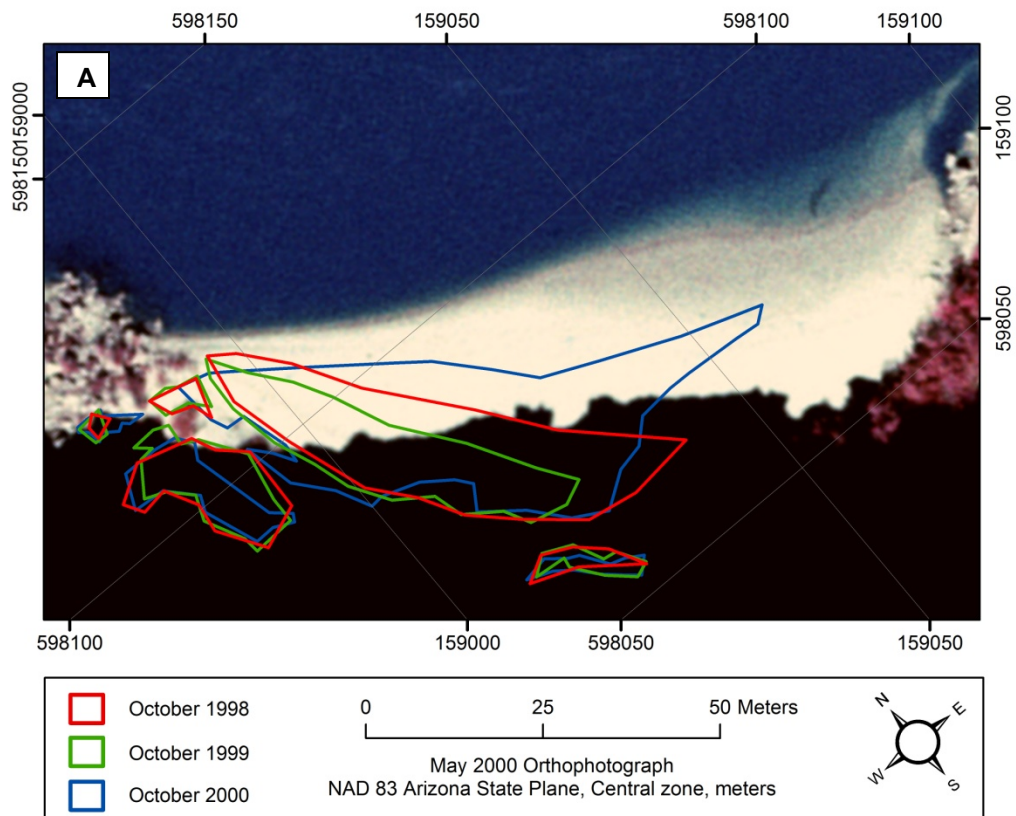
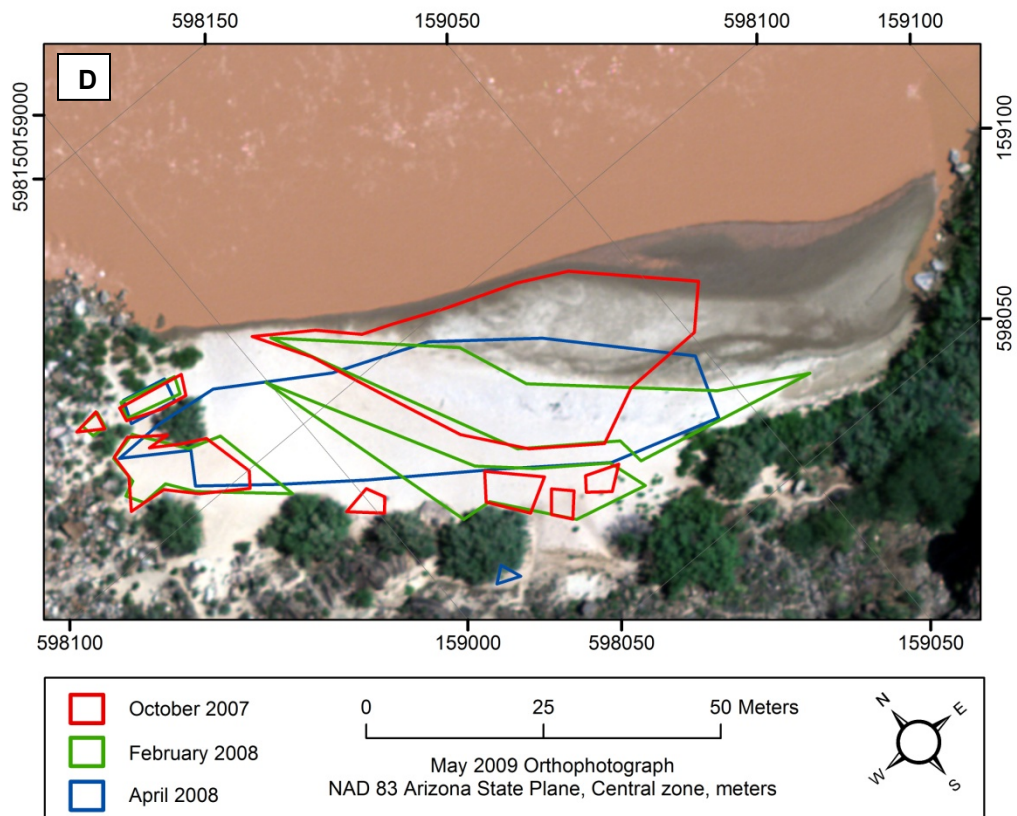
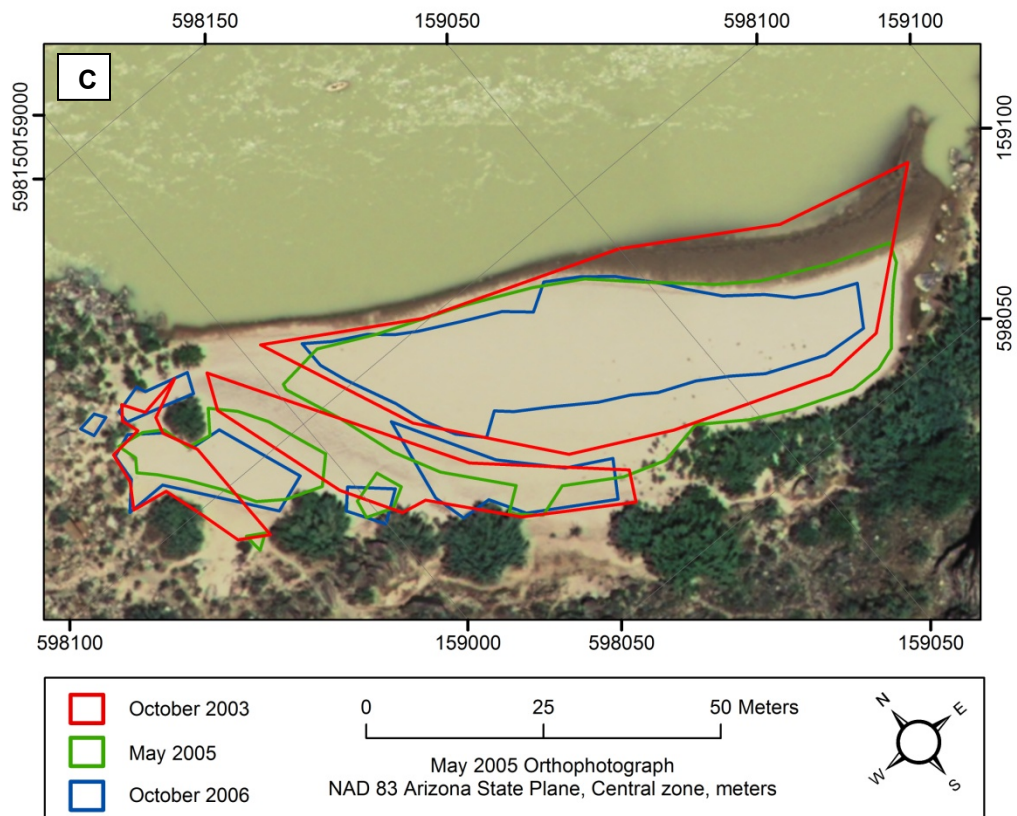


Figure A101. Time series plot of campsite area at Football Field camp (River Mile 137.7L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A27 for data.





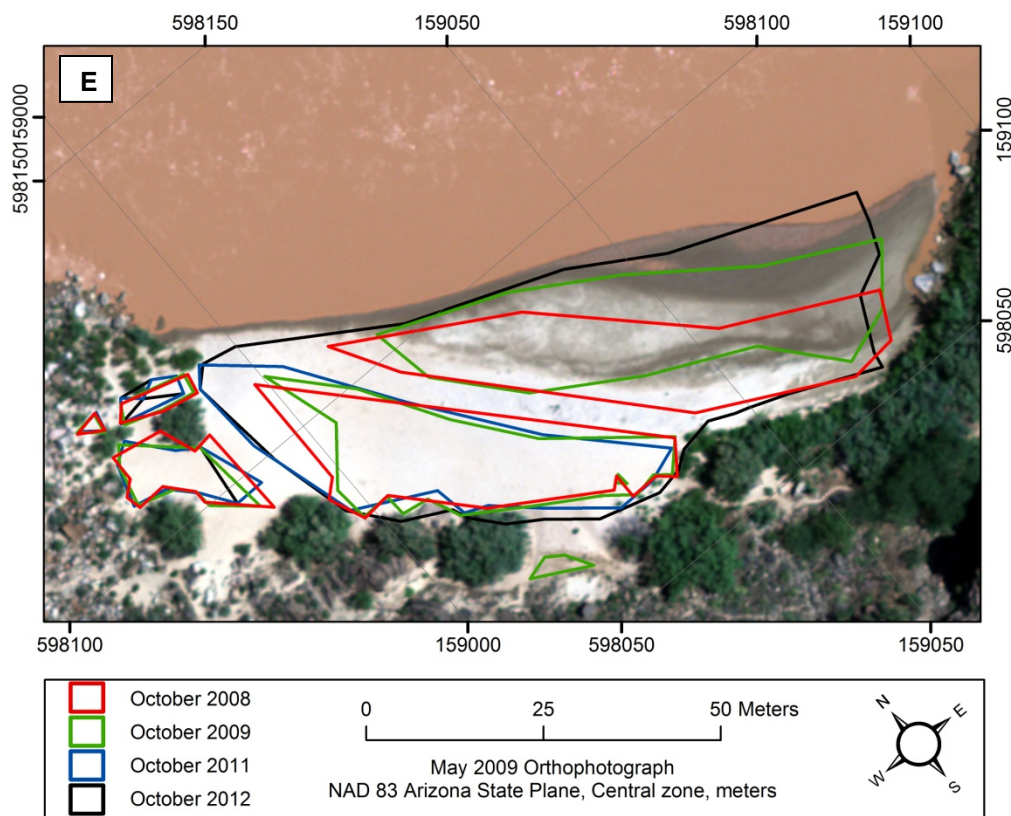


Figure A102. Maps showing campsite areas measured at Middle Poncho's camp (River Mile 137.7L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Note that campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A103. Remote camera photographs showing Middle Poncho's camp located at River Mile 137.7L. Flow in main channel is from left to right. (A) Photograph taken on October 8, 1998; (B) Photograph taken on February 25, 2013.

Campsite Name: Fishtail

River Mile: 139.6, River Right

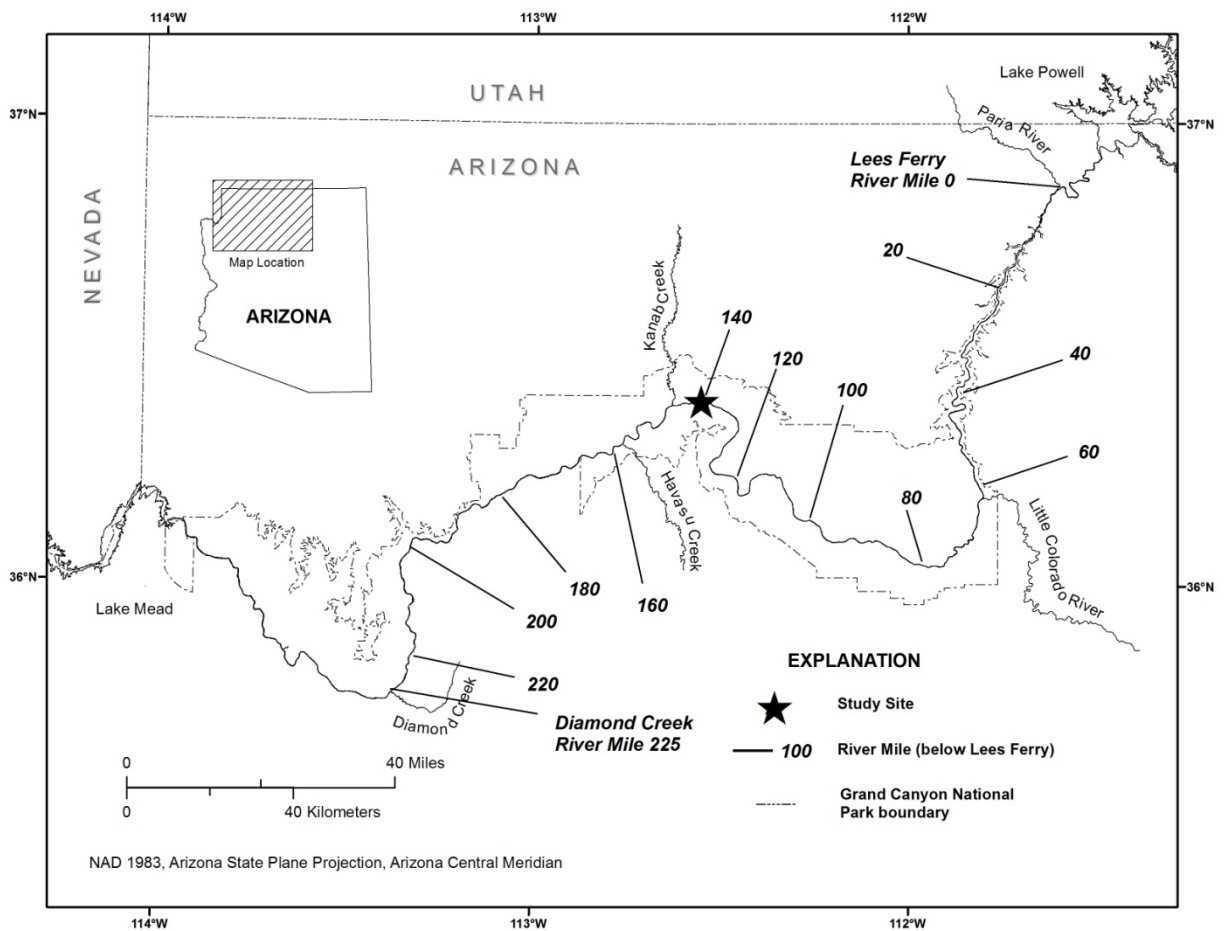


Figure A104. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Fishtail camp study site (River Mile 139.6R).

Table A28. Campsite area in different stage-elevation zones at Fishtail camp (River Mile 139.6R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		0	0	0	61	240	0	301	301
10/10/1999		0	0	0	40	217	0	257	257
10/24/2000		128	64	0	35	138	192	173	365
10/15/2001	6	102	44	0	31	40	146	71	217
10/2/2002	0	0	0	0	24	46	0	70	70
5/7/2003	0	118	15	0	47	44	133	91	224
10/2/2003	0	0	0	0	56	41	0	97	97
5/18/2005	0	13	8	50	29	24	21	103	124
10/19/2006	3	31	0	0	40	31	31	71	102
10/25/2007	32	35	0	0	31	26	35	57	92
2/13/2008	51	21	0	0	39	38	21	77	98
4/9/2008	0	0	0	0	42	17	0	59	59
10/22/2008	34	81	0	0	54	9	81	63	144
10/21/2009	41	1	0	0	61	18	1	79	80
10/15/2011		0	0	0	27	42	0	70	70
10/13/2012	102	52	0	0	44	22	52	67	119

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

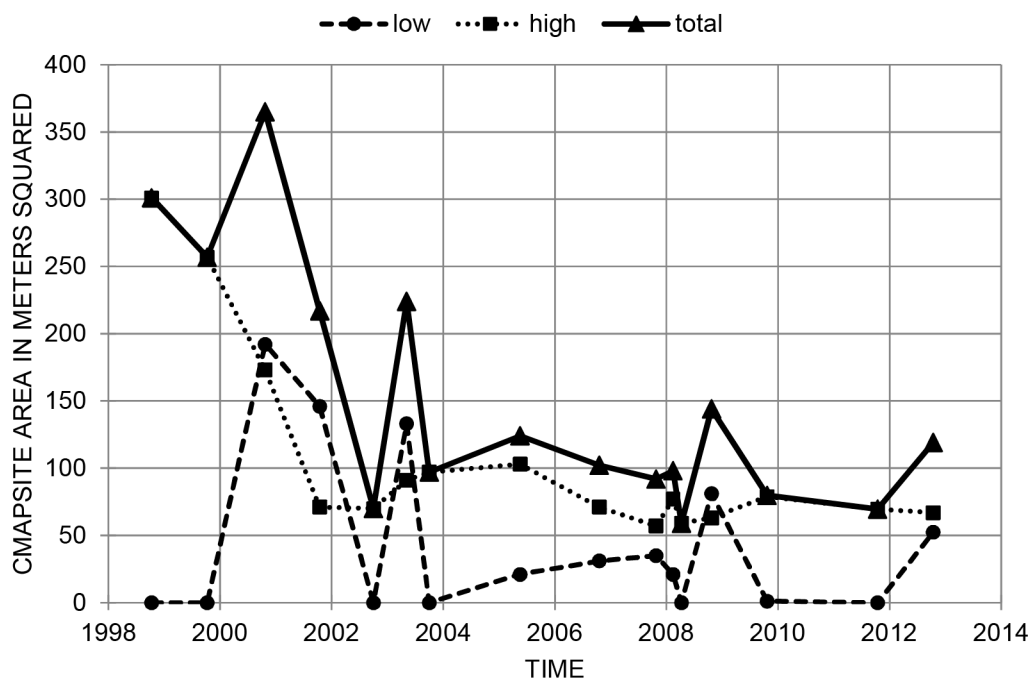
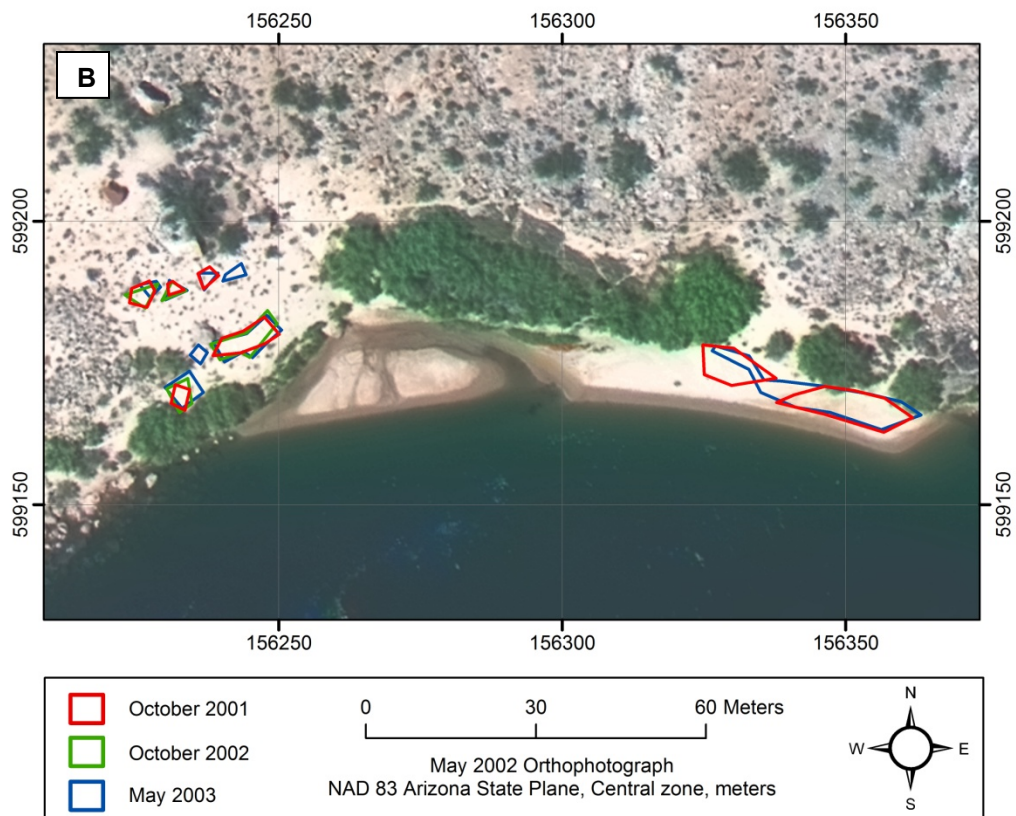
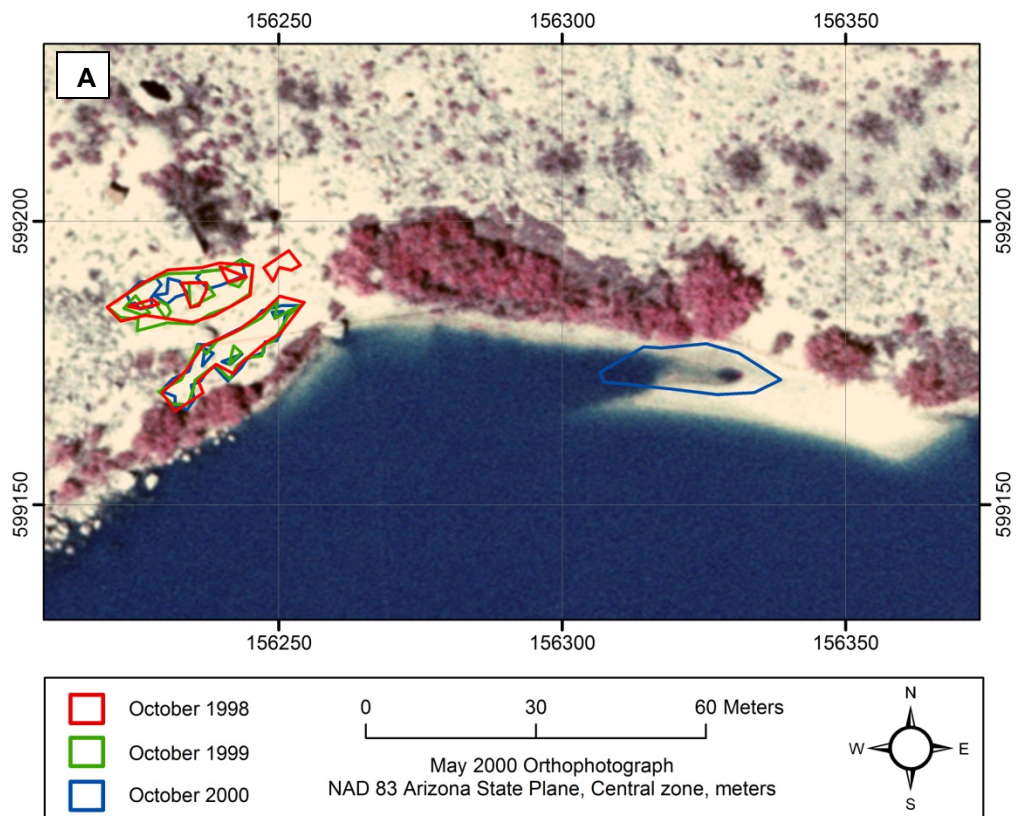
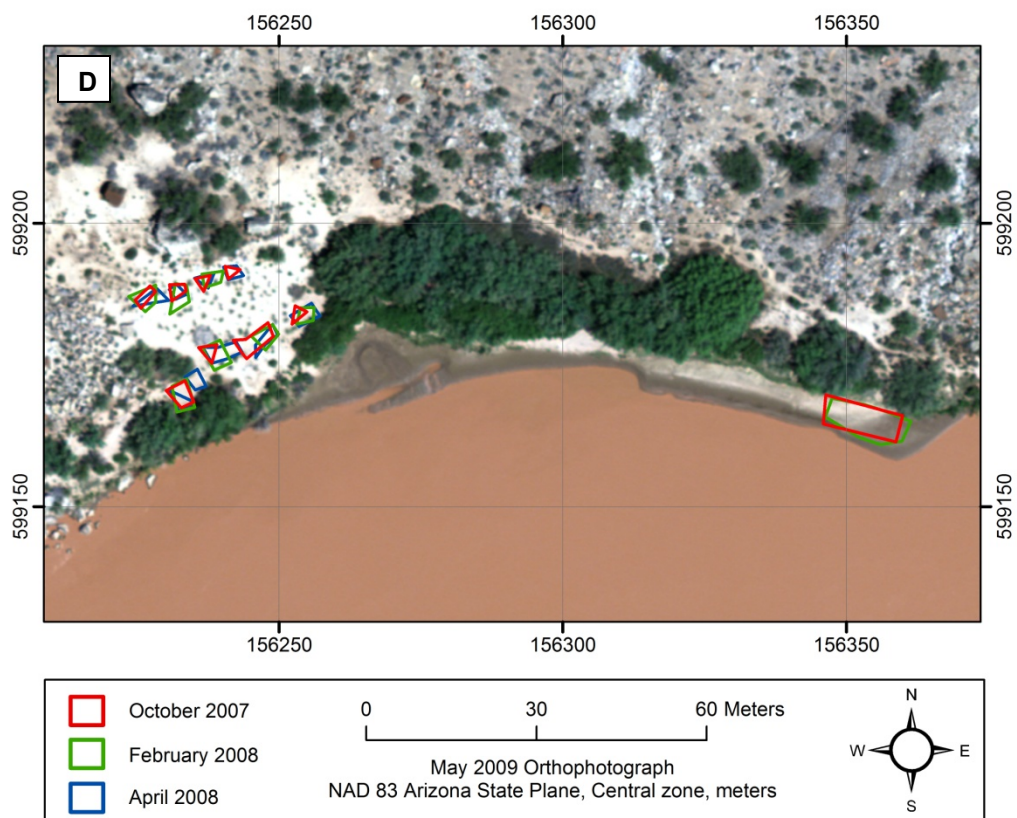
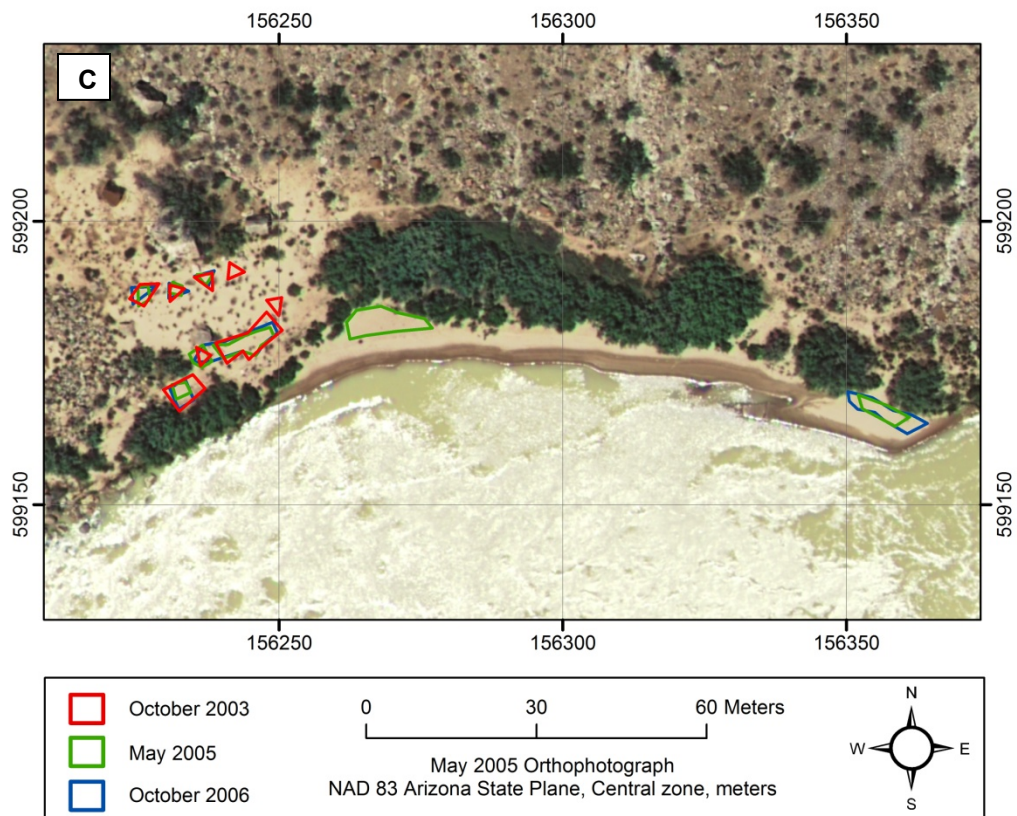


Figure A105. Time series plot of campsite area at Fishtail camp (River Mile 139.6R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A28 for data.





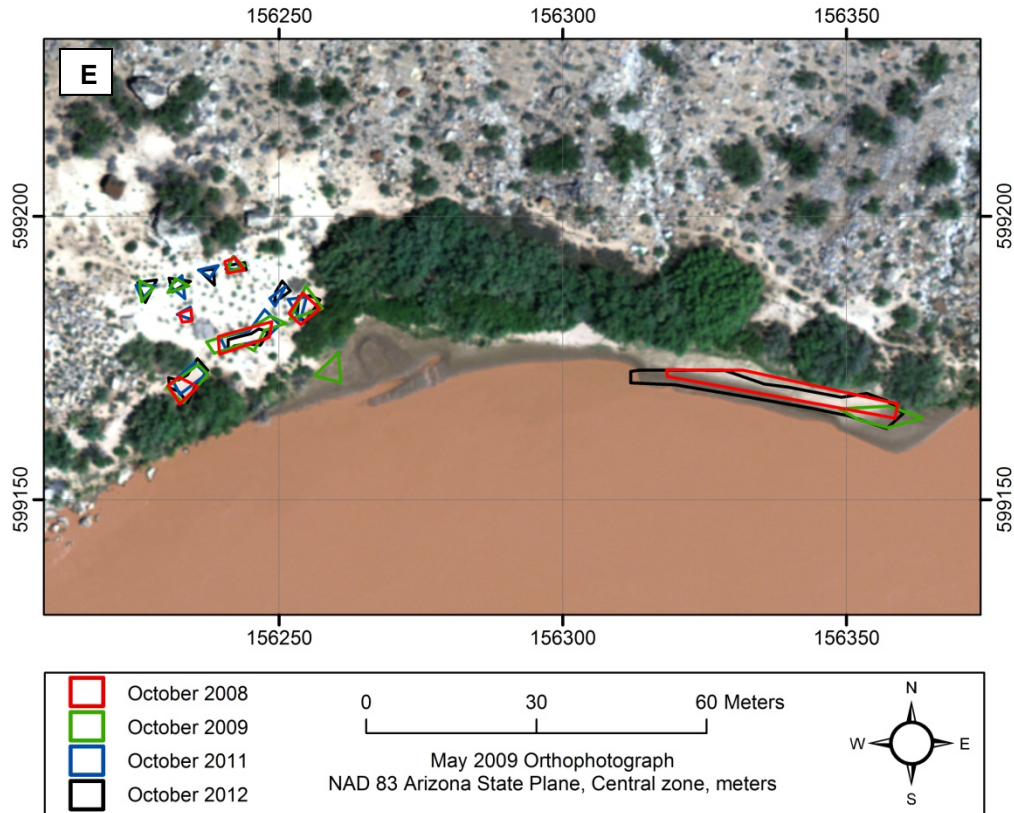


Figure A106. Maps showing campsite areas measured at Fishtail camp (River Mile 139.6R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Note that campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A107. Remote camera photograph showing Fishtail camp at River Mile 139.6R. Flow in main channel is from right to left. (A) Photograph taken on June 1, 1998; (B) Photograph taken on November 15, 2008.

Campsite Name: 145 Mile

River Mile: 145.9, River Left

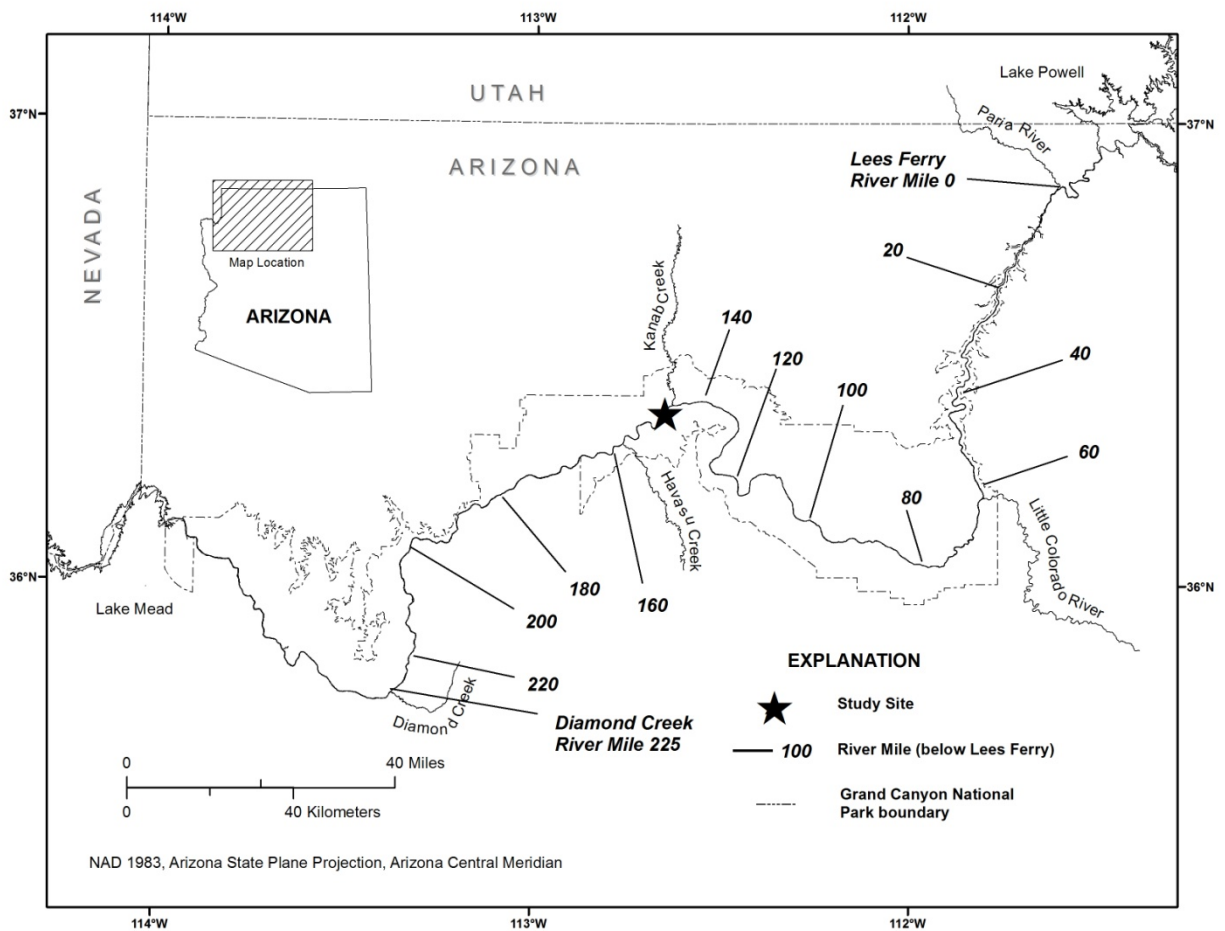


Figure A108. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 145 Mile camp study site (River Mile 145.9L).

Table A29. Campsite area in different stage-elevation zones at 145 Mile camp (River Mile 145.9L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/19/1998	23	160	50	0	62	55	210	117	327
10/12/1999		146	82	0	45	65	228	110	338
10/24/2000		0	219	153	11	40	219	204	423
10/16/2001	50	20	142	62	9	32	162	103	265
10/2/2002	13	74	146	69	13	26	220	108	328
5/7/2003	0	144	99	66	9	20	243	95	338
10/3/2003	31	87	120	54	17	18	207	89	296
5/18/2005	0	81	7	0	173	7	88	180	268
10/19/2006	15	34	0	0	154	0	34	154	188
10/25/2007	20	3	0	0	145	0	3	145	148
2/13/2008	12	9	0	9	94	0	9	103	112
4/9/2008	0	0	0	113	281	0	0	394	394
10/22/2008	0	7	0	81	236	0	7	317	324
10/21/2009	24	14	0	94	208	0	14	302	315
10/15/2011		0	263	0	96	0	263	96	359
10/14/2012	48	92	154	14	98	2	246	114	360

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

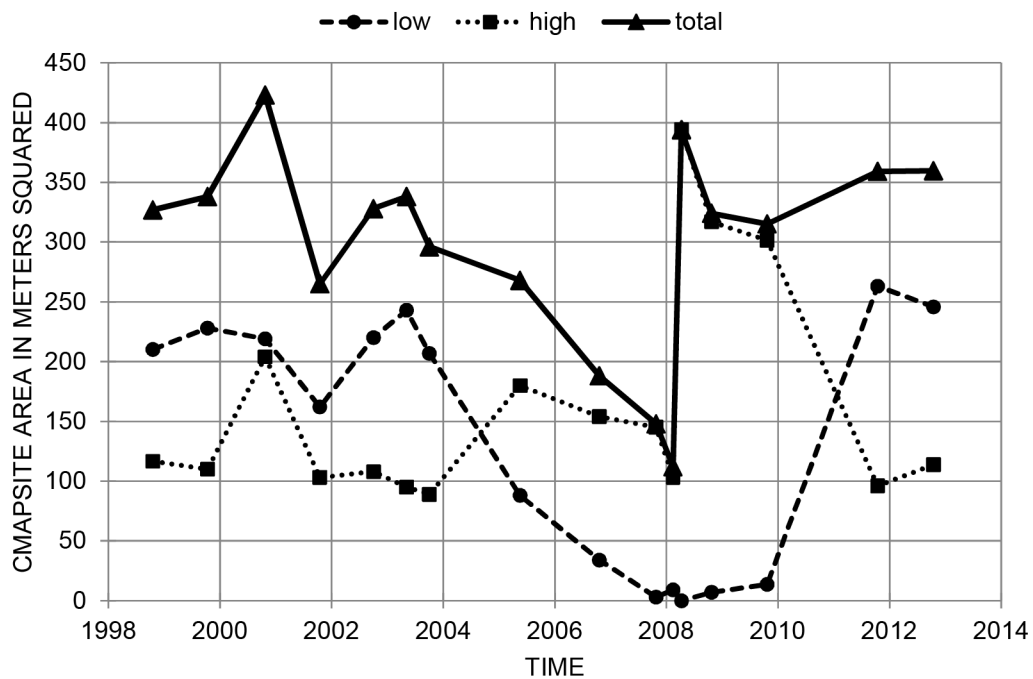
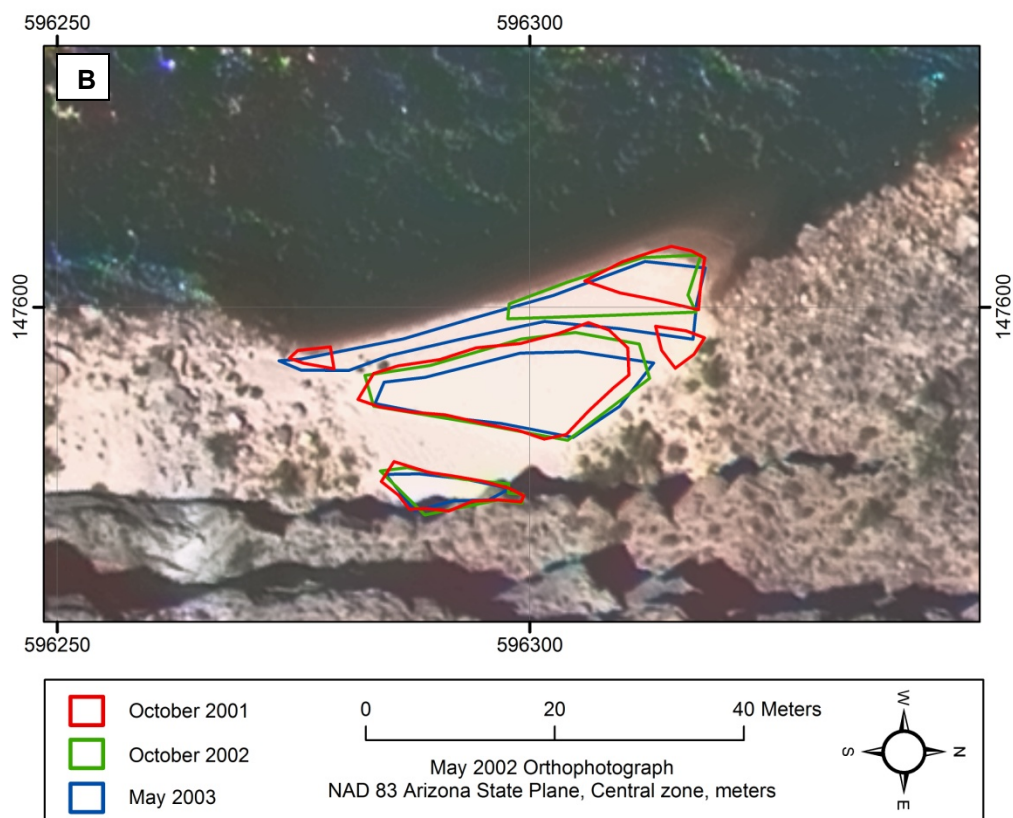
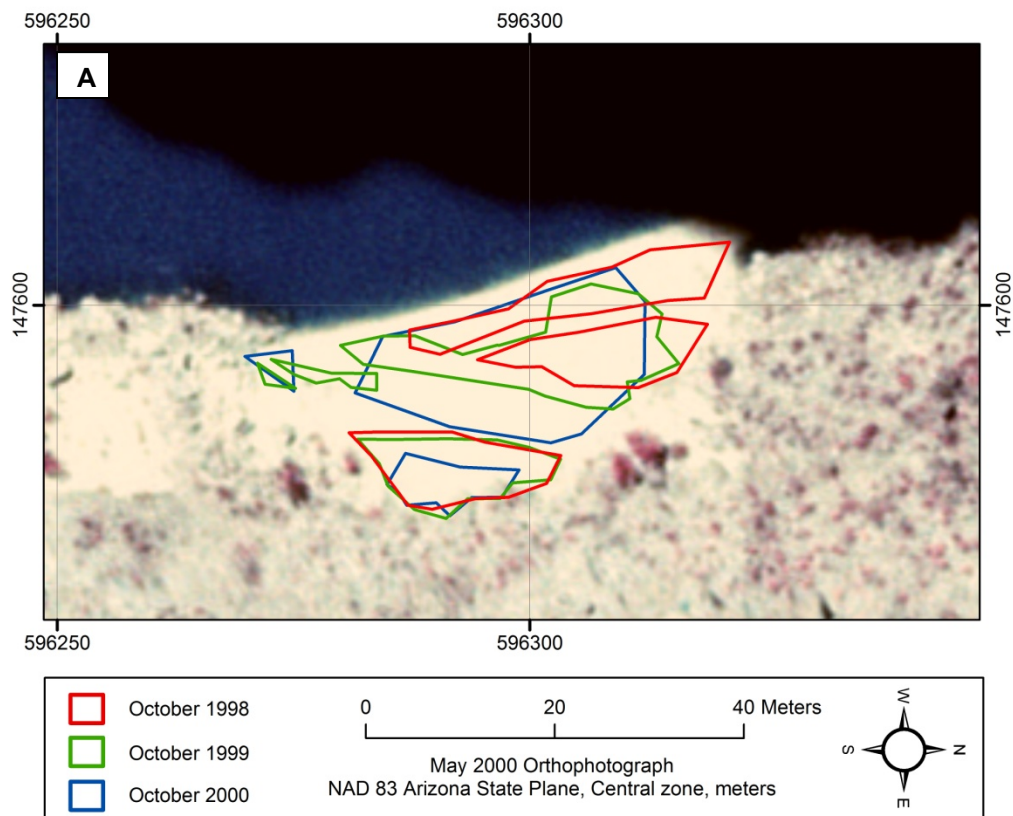
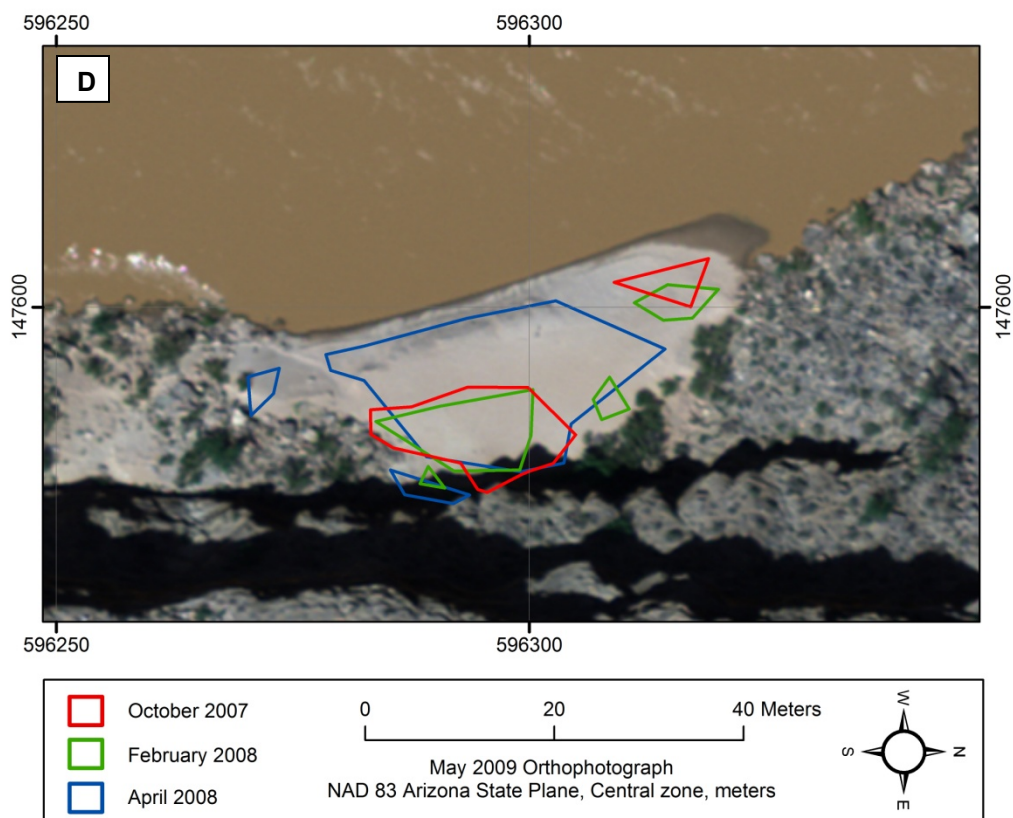
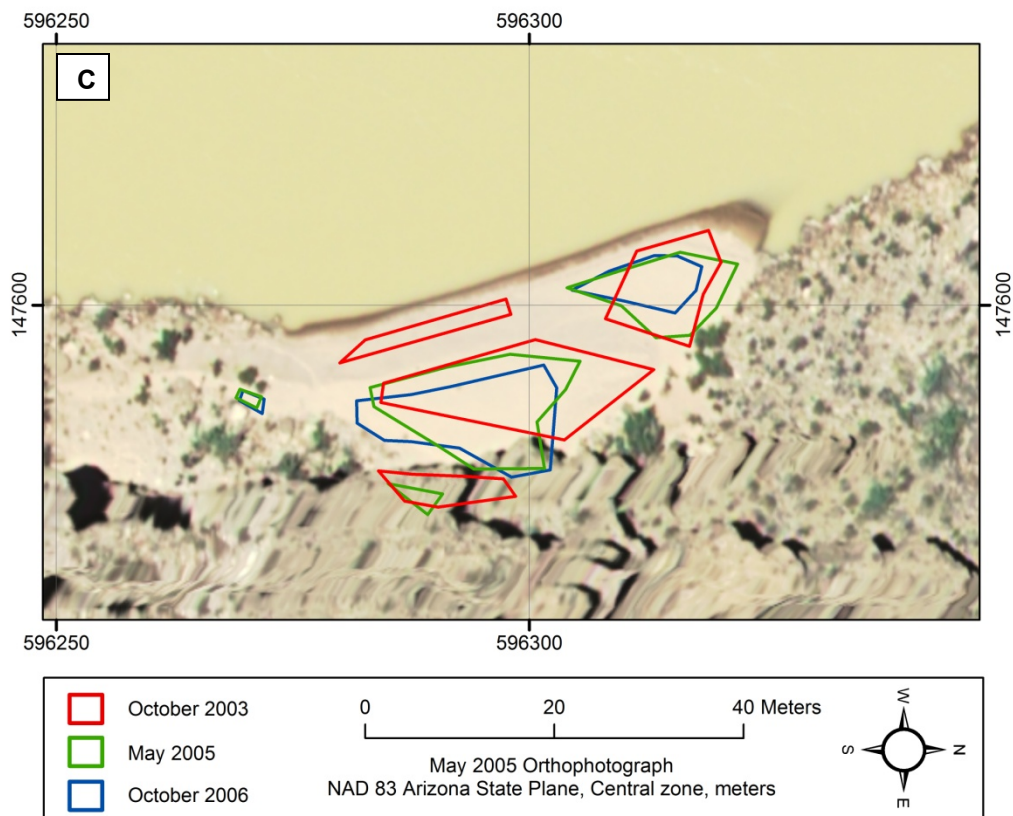


Figure A109. Time series plot of campsite area at 145 Mile camp (River Mile 145.9L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A29 for data.





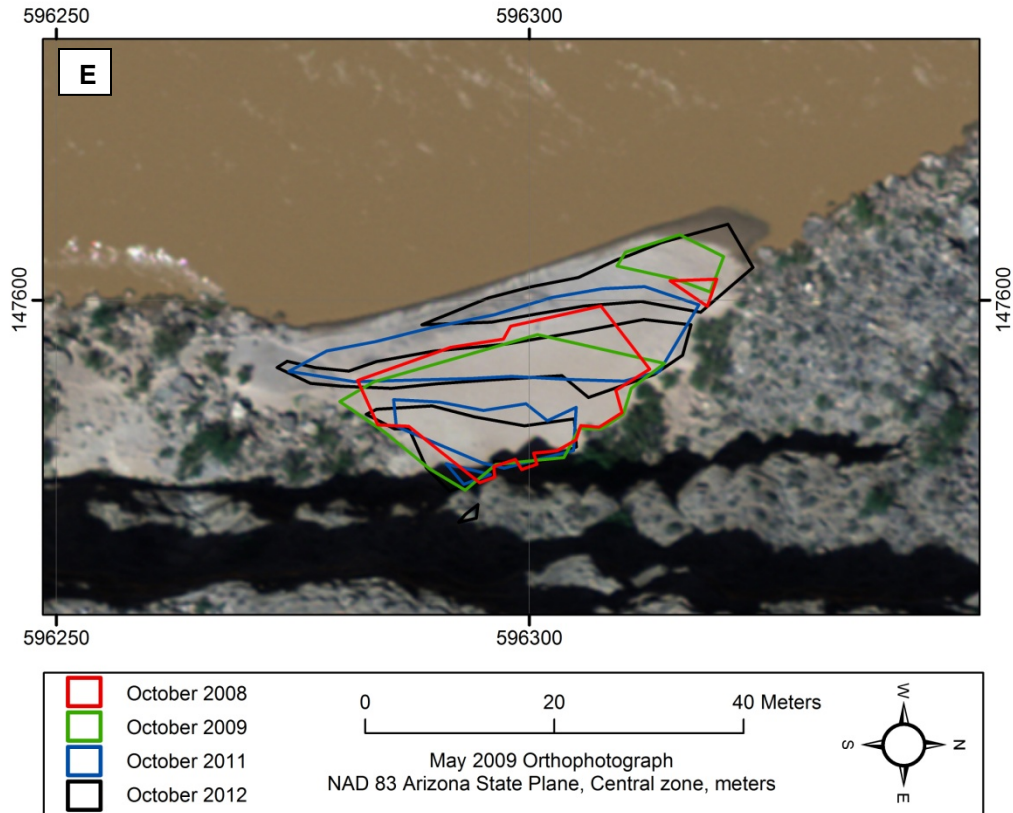


Figure A110. Maps showing campsite areas measured at 145 Mile camp (River Mile 145.9L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Note that campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A111. Remote camera photographs showing 145 Mile camp at River Mile 145.9L. Flow in main channel is from left to right. (A) Photograph taken on October 25, 1998; (B) Photograph taken on October 15, 2012.

Campsite Name: Lower National

River Mile: 167.1, River Left

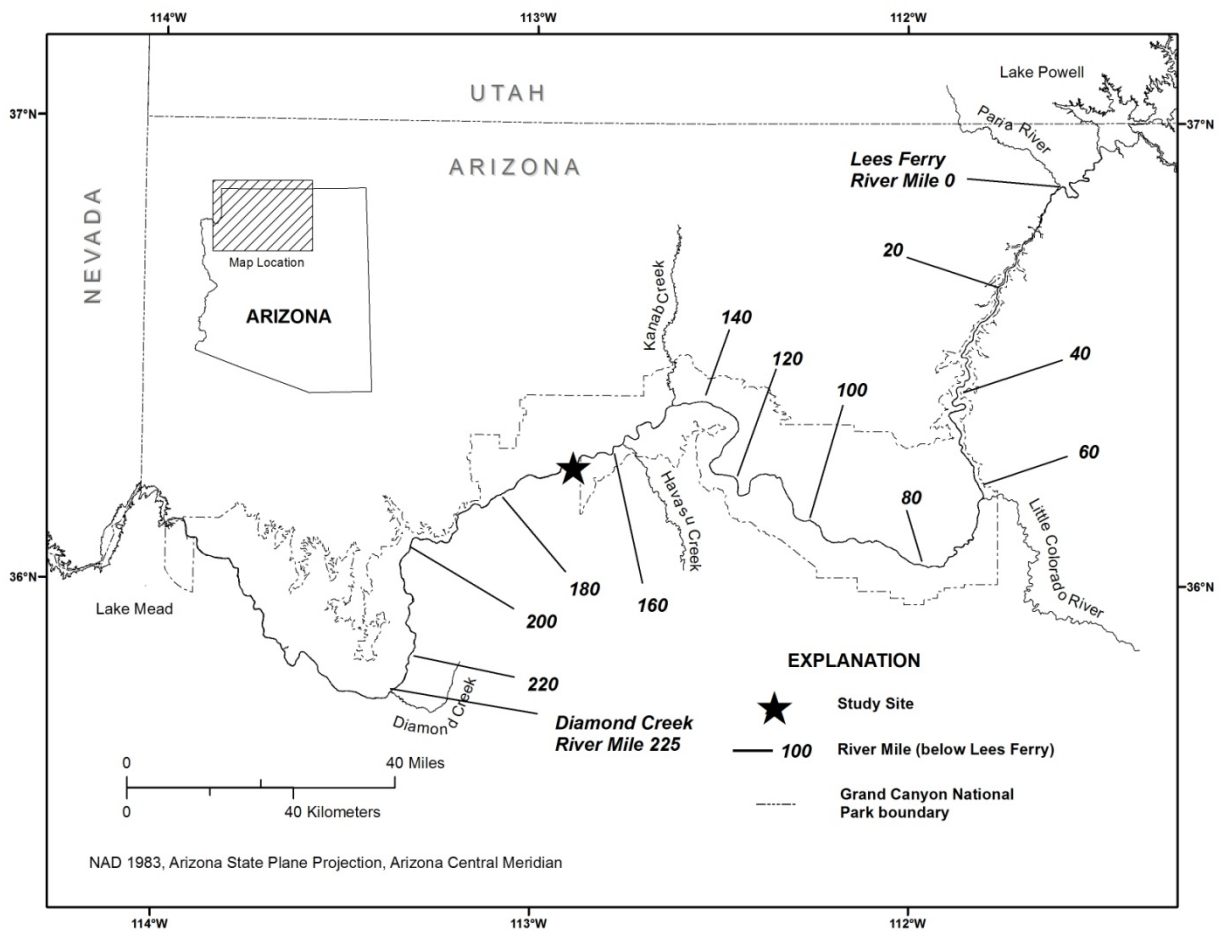


Figure A112. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Lower National camp study site (River Mile 167.1L).

Table A30. Campsite area in different stage-elevation zones at Lower National camp (River Mile 167.1L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/3/2002	70	117	112	105	91	17	229	213	442
5/10/2003	0	18	130	99	82	18	148	199	347
10/3/2003	60	108	143	59	86	20	251	165	416
5/20/2005	0	81	129	88	93	14	210	195	405
10/20/2006	0	114	91	63	90	15	205	168	373
10/26/2007	16	37	78	35	68	10	115	113	228
2/15/2008	0	16	54	7	72	9	70	88	158
4/10/2008	7	43	0	85	43	0	43	128	171
10/23/2008	0	139	30	6	25	11	169	42	211
10/22/2009	62	183	47	2	36	11	229	49	278
10/16/2011		0	220	19	28	10	220	56	276
10/16/2012	284	131	9	7	35	14	140	56	196

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = greater than 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = greater than 25,000 ft³/s

total = all campsite area measured at elevations greater than 15,000 ft³/s

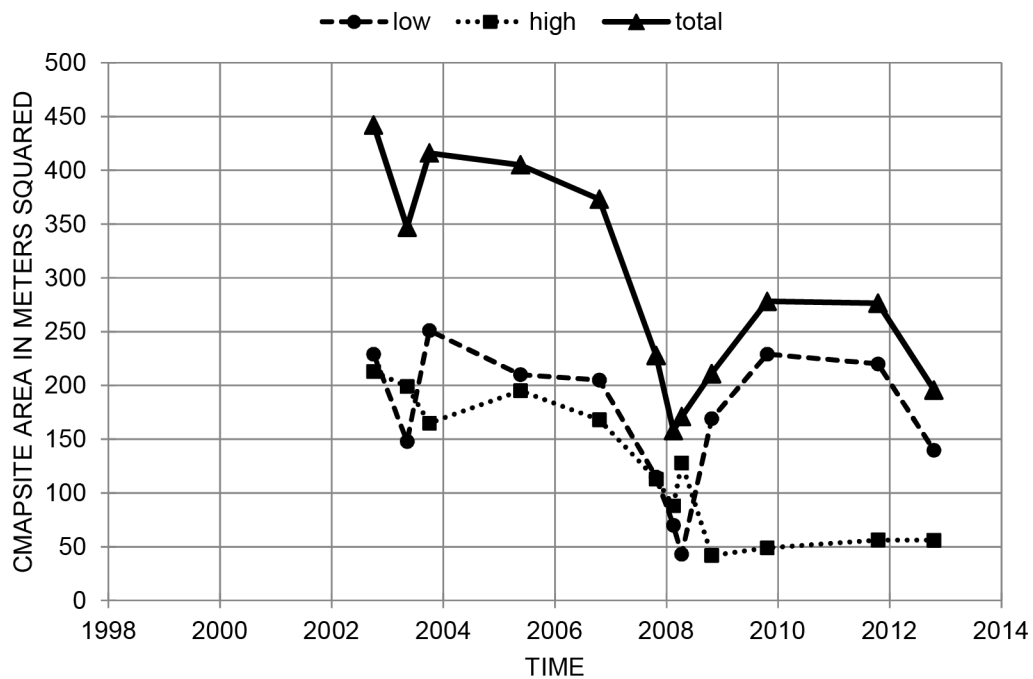
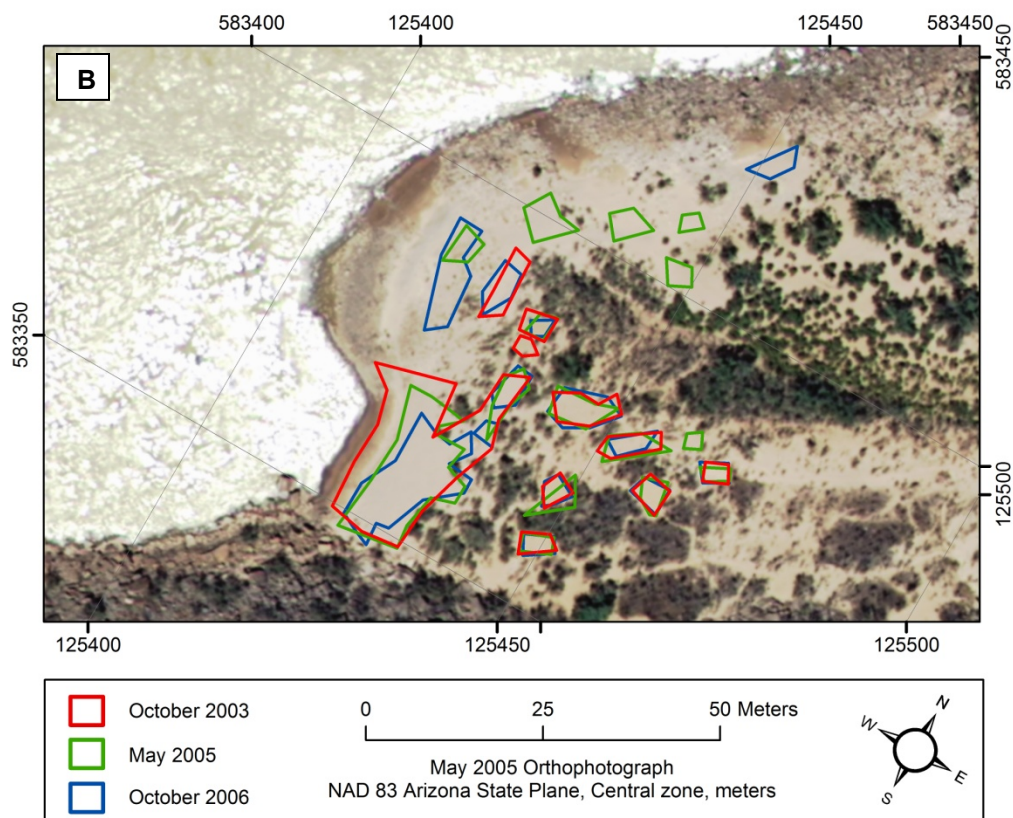
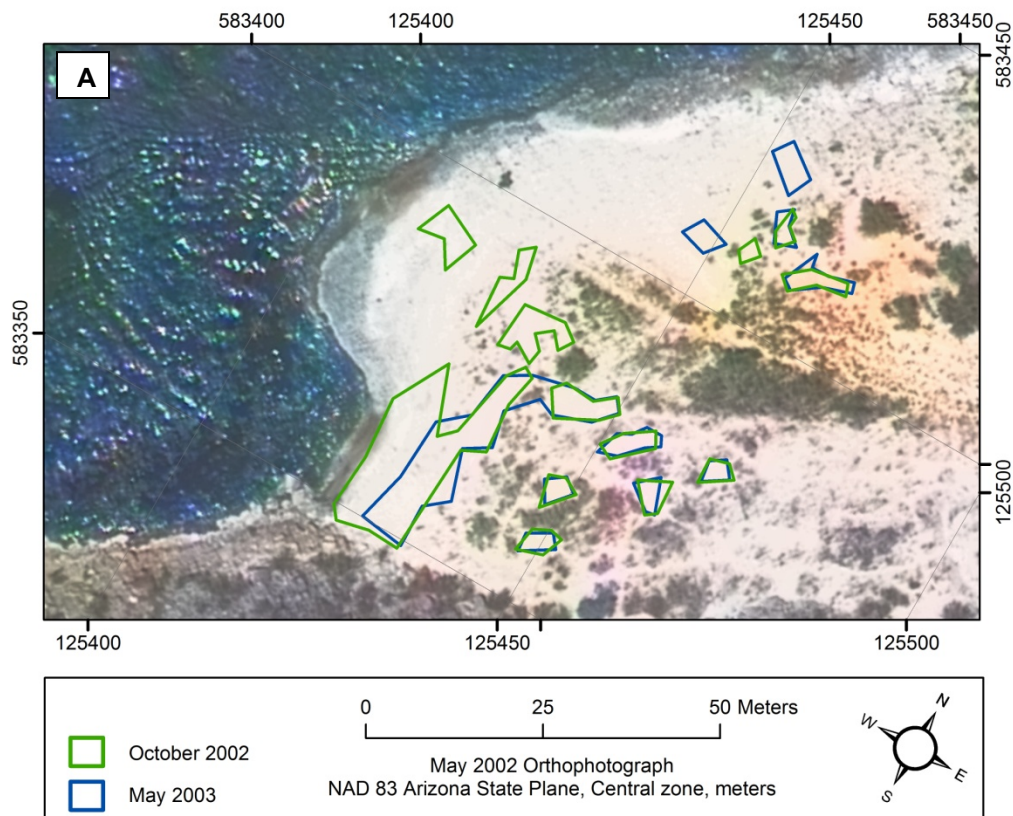


Figure A113. Time series plot showing campsite area at Lower National camp (River Mile 167.1L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A30 for data.



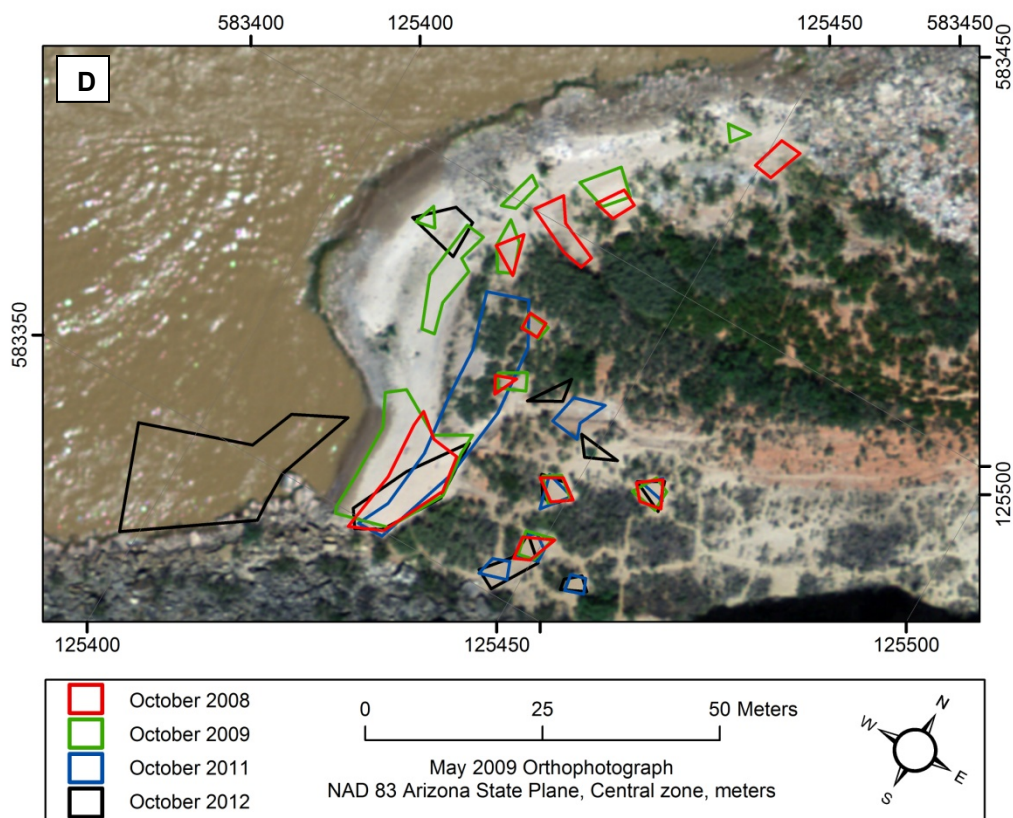
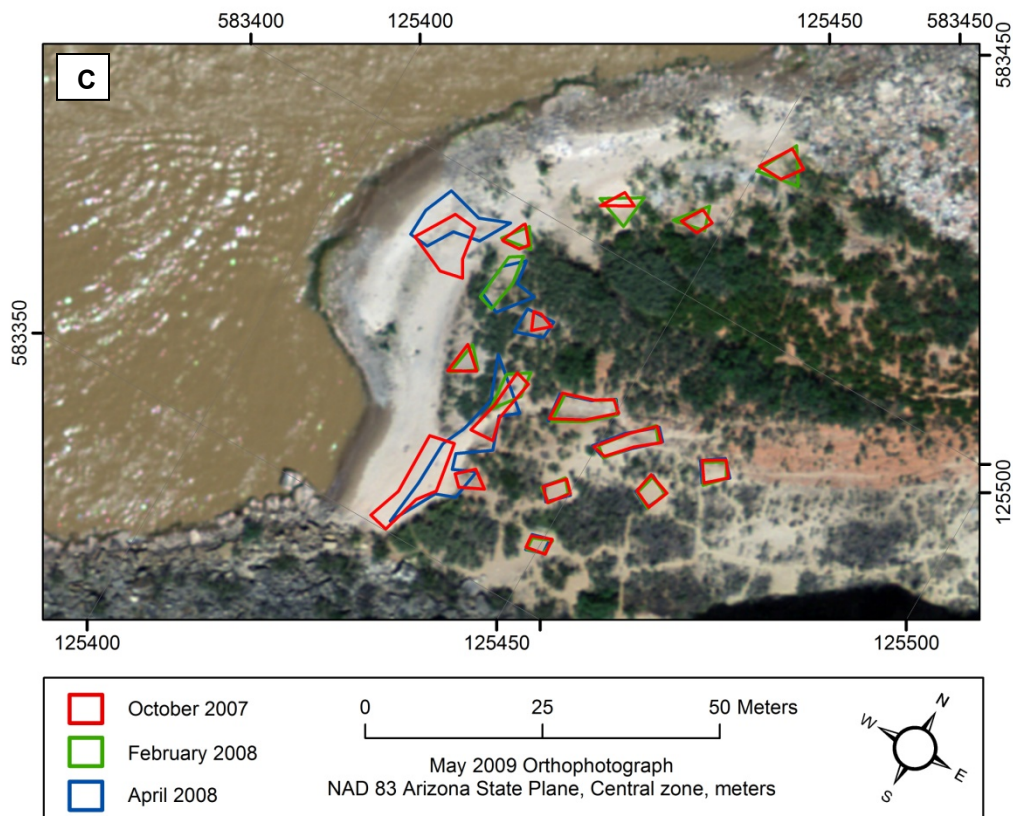


Figure A114. Map showing campsite areas measured at Lower National camp (River Mile 167.1L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A115. Remote camera photograph showing Lower National camp located at River Mile 167.1L. Flow in main channel is from left to right. Photograph taken on March 2, 2013.

Campsite Name: 172 Mile

River Mile: 172.2, River Left

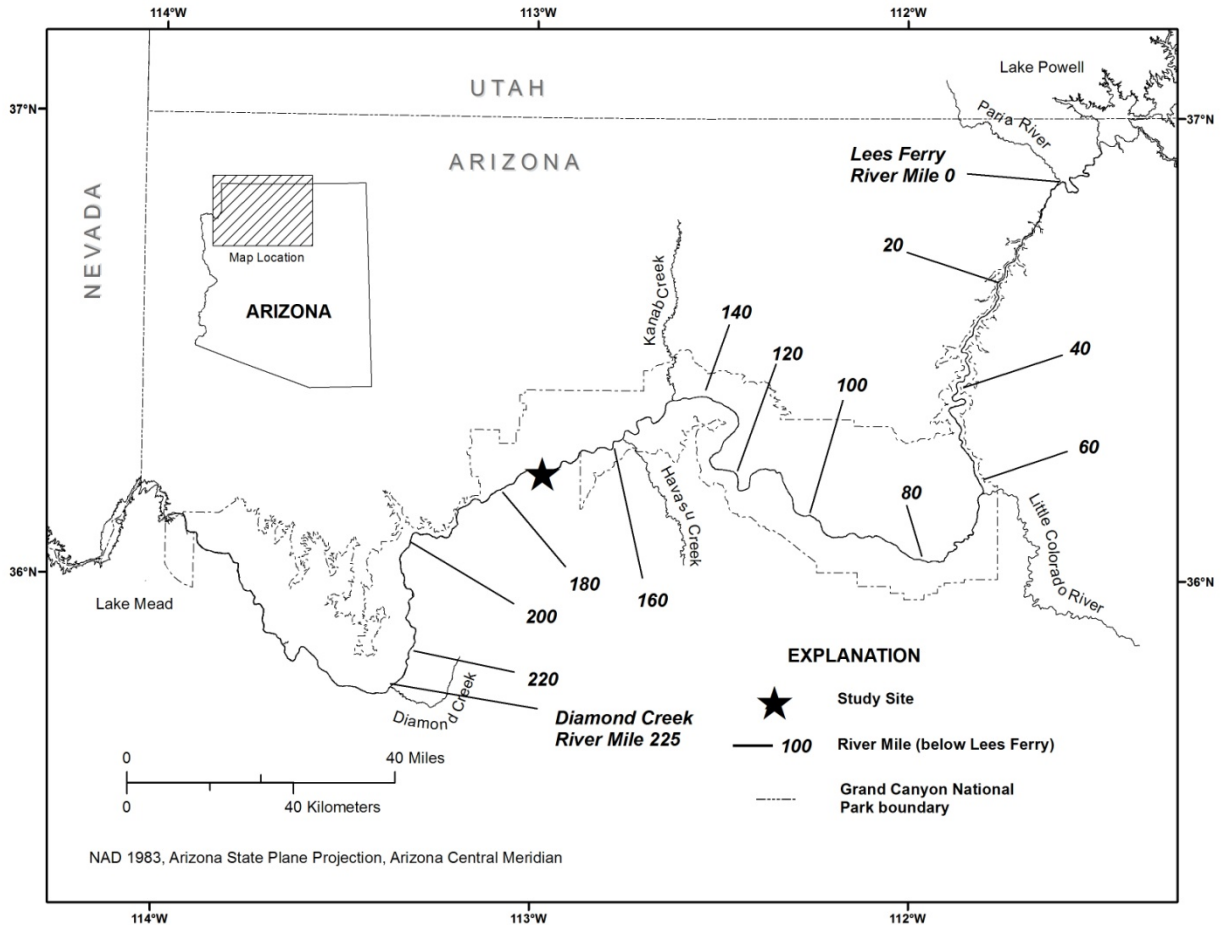


Figure A116. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 172 Mile camp study site (River Mile 172.2L).

Table A31. Campsite area in different stage-elevation zones at 172 Mile camp (River Mile 172.2L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/28/1998		0	0	0	47	71	0	118	118
10/13/1999		1	39	0	13	7	40	20	60
10/25/2000	0	131	14	0	2	0	145	2	147
10/21/2001	0	50	0	0	0	0	50	0	50
10/5/2002	0	0	0	0	0	0	0	0	0
5/10/2003	0	0	0	0	0	0	0	0	0
10/4/2003	0	0	0	0	0	0	0	0	0
5/20/2005	0	311	7	42	66	0	318	108	426
10/20/2006	0	0	0	0	0	0	0	0	0
10/27/2007	0	0	0	0	0	0	0	0	0
2/15/2008	0	0	0	0	0	0	0	0	0
4/10/2008	26	141	73	18	158	0	214	176	390
10/24/2008	0	0	0	0	0	0	0	0	0
10/23/2009	601	0	0	0	0	0	0	0	0
10/17/2011		0	304	0	0	0	304	0	304
10/16/2012	0	0	0	0	0	0	0	0	0

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

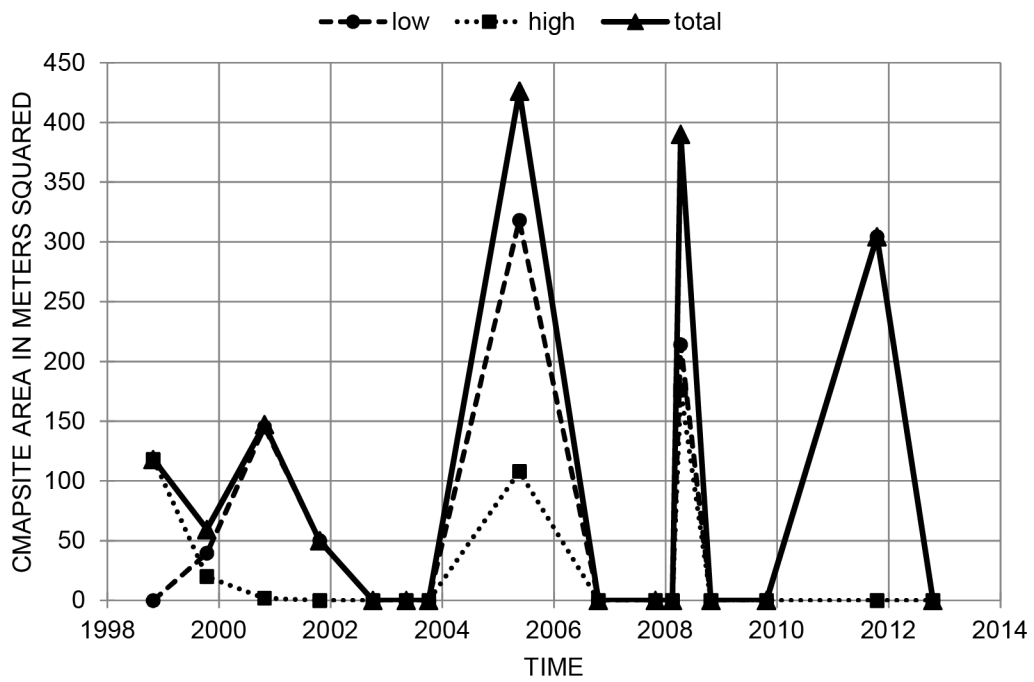
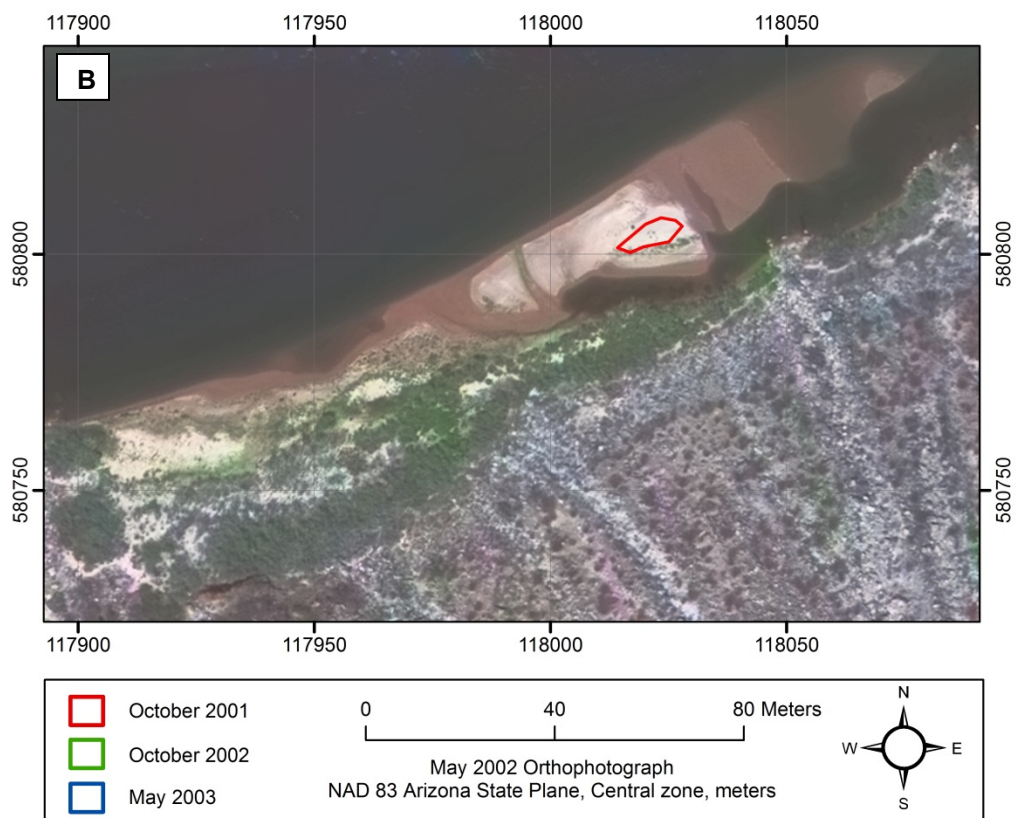
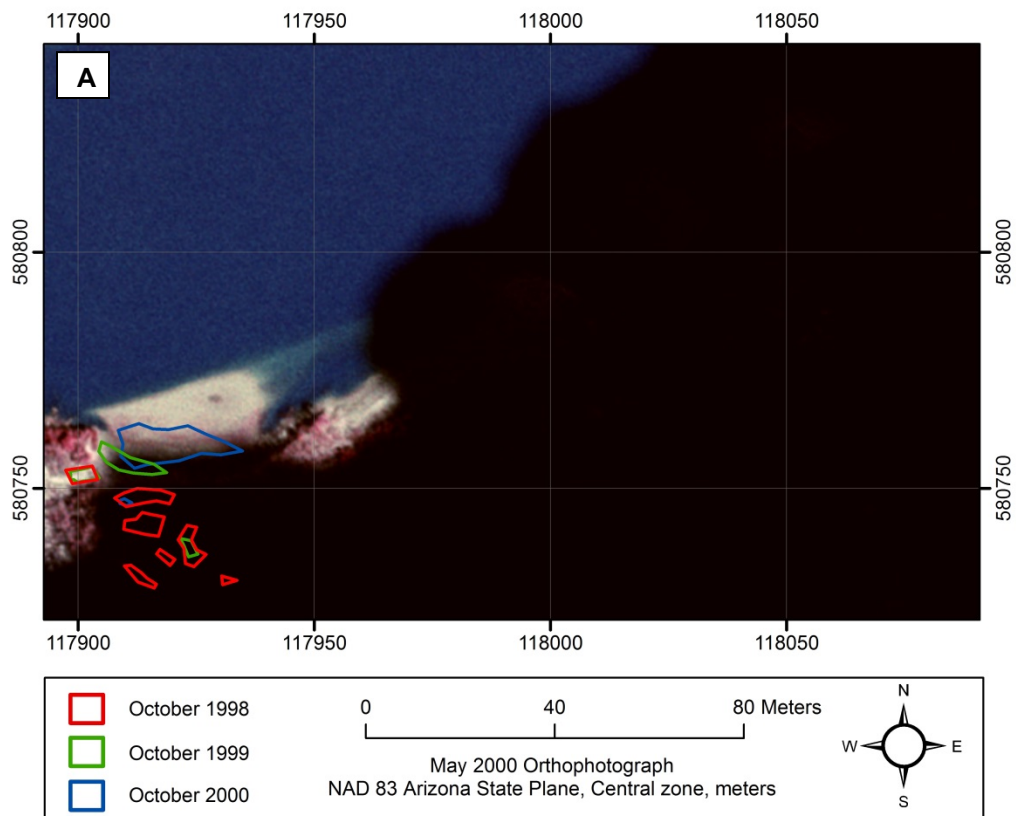
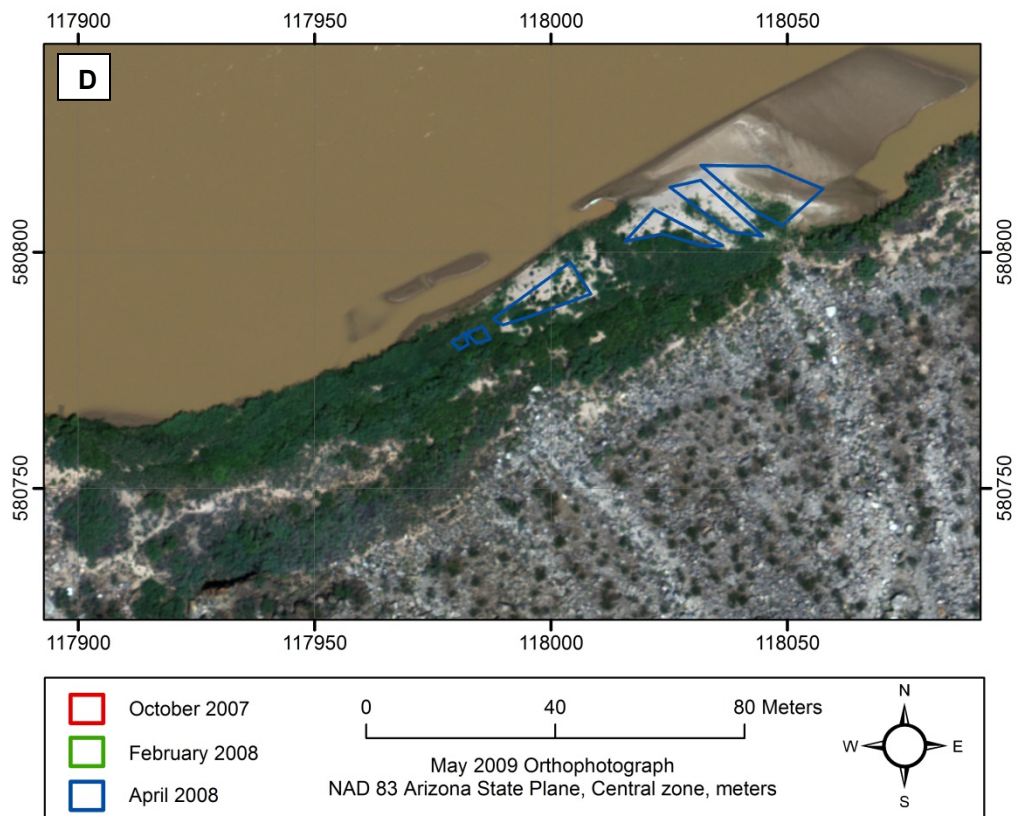
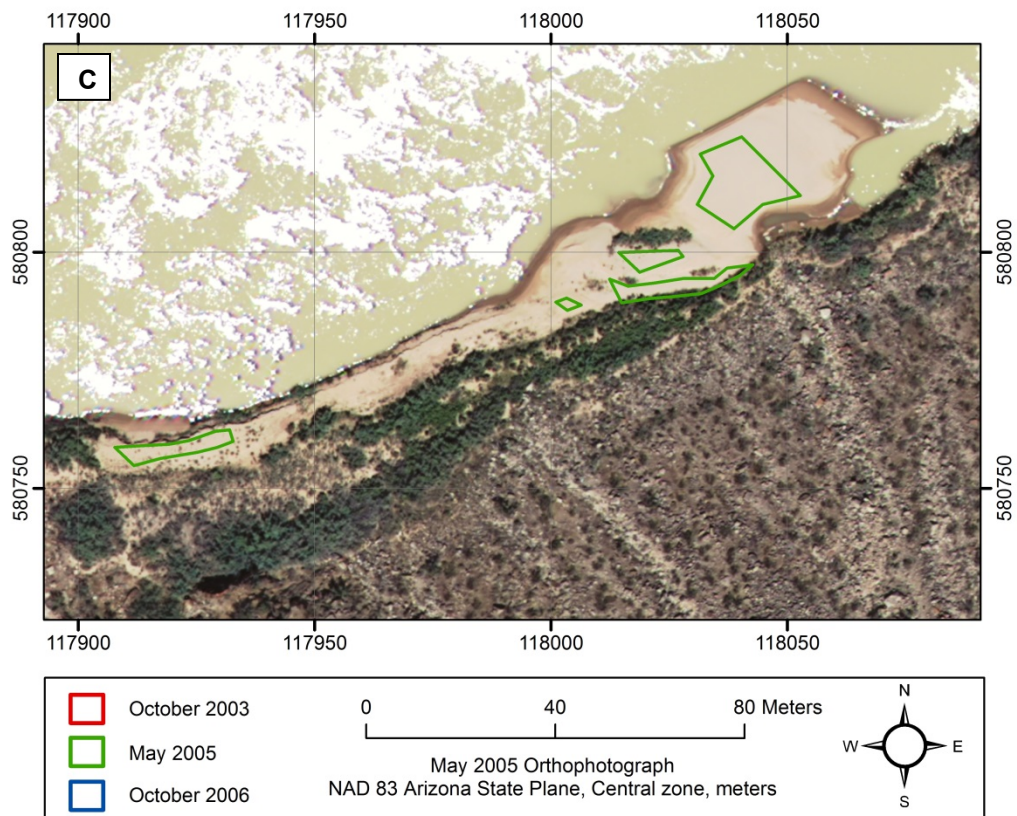


Figure A117. Time series plot showing campsite area at 172 Mile camp (River Mile 172.2L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A31 for data.





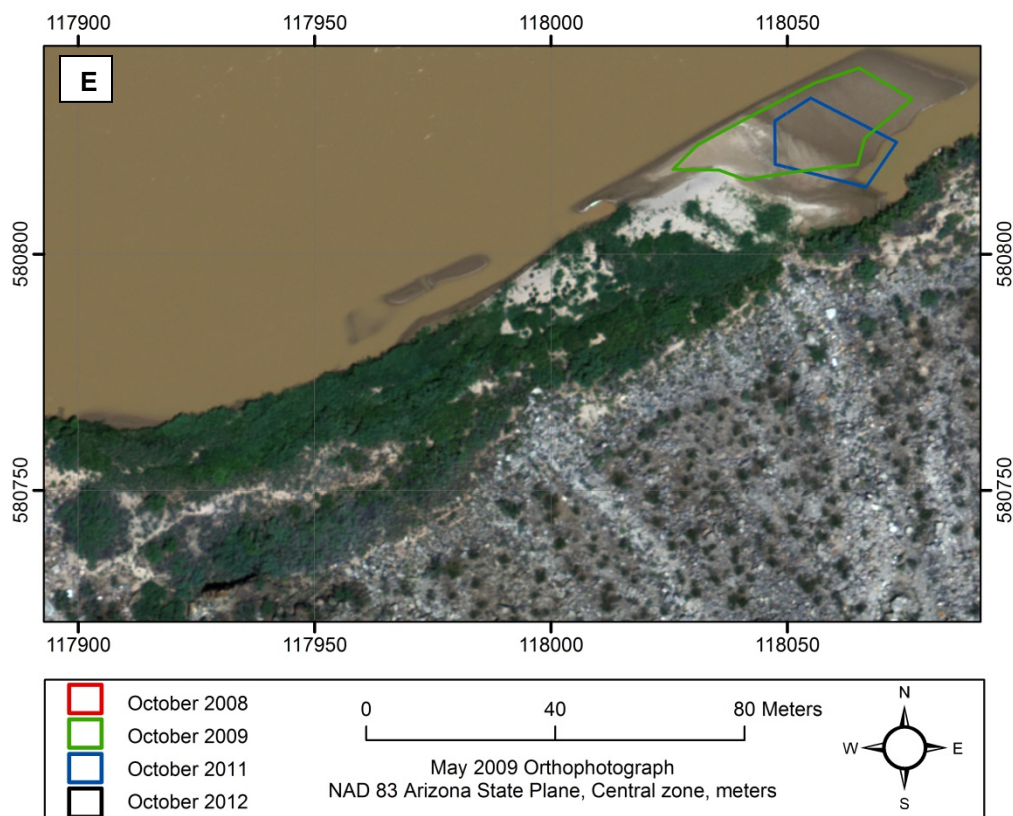


Figure A118. Maps showing campsite areas measured at 172 Mile camp (River Mile 172.2L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A119. Remote camera photographs showing 172 Mile camp at River Mile 172.2L. Flow in main channel is from left to right. (A) Photograph taken on October 20, 1998; (B) Photograph taken on October 13, 2012.

Campsite Name: 183 Mile Left

River Mile: 183.3, River Left

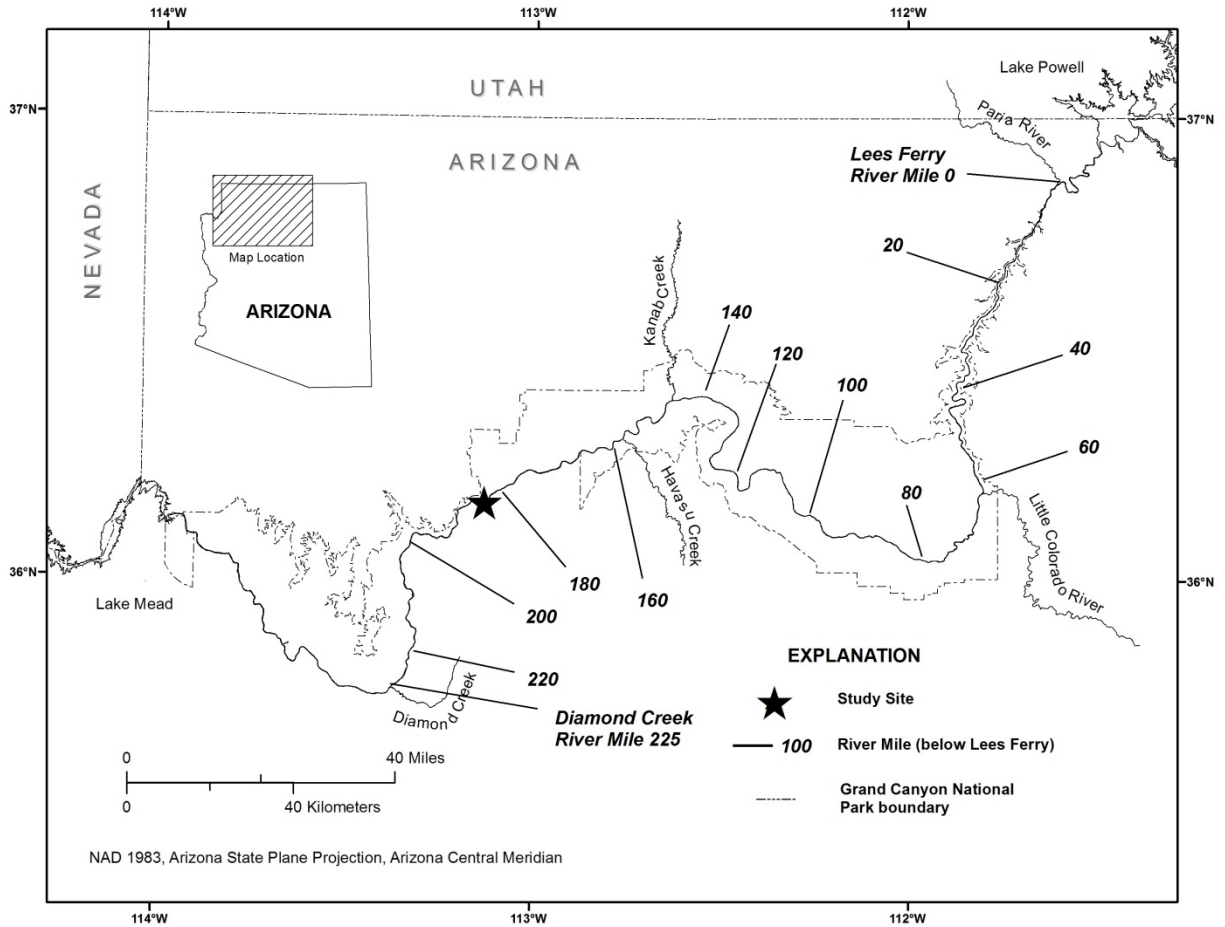


Figure A120. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 183 Mile Left camp study site (River Mile 183.3L).

Table A32. Campsite area in different stage-elevation zones at 183 Mile Left camp (River Mile 183.3L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/12/1998		44	441	208	229	0	485	437	922
10/13/1999	392	79	31	6	109	0	110	115	225
10/25/2000	0	0	51	217	69	0	51	286	337
10/17/2001	3	56	24	182	42	0	80	224	304
10/5/2002	39	2	68	111	50	0	70	161	231
5/10/2003	0	0	67	114	27	5	67	146	213
10/4/2003	0	111	101	112	44	0	212	156	368
5/21/2005	0	51	134	5	31	0	185	36	221
10/20/2006	0	0	108	9	29	0	108	38	146
10/27/2007	0	64	92	5	17	0	156	22	178
2/15/2008	0	6	101	6	15	0	107	21	128
4/11/2008	0	20	77	318	12	0	97	330	427
10/24/2008	0	0	4	111	34	0	4	145	149
10/23/2009	0	0	2	119	20	0	2	138	141
10/18/2011		0	242	53	11	0	242	64	306
10/17/2012	10	141	50	67	5	0	190	73	263

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

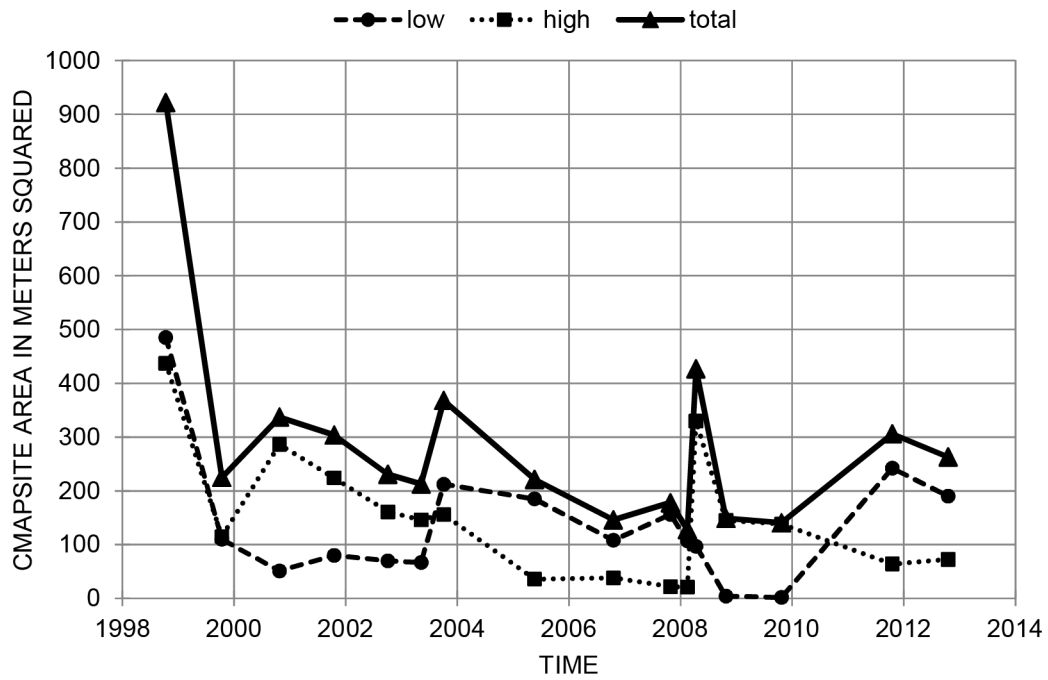
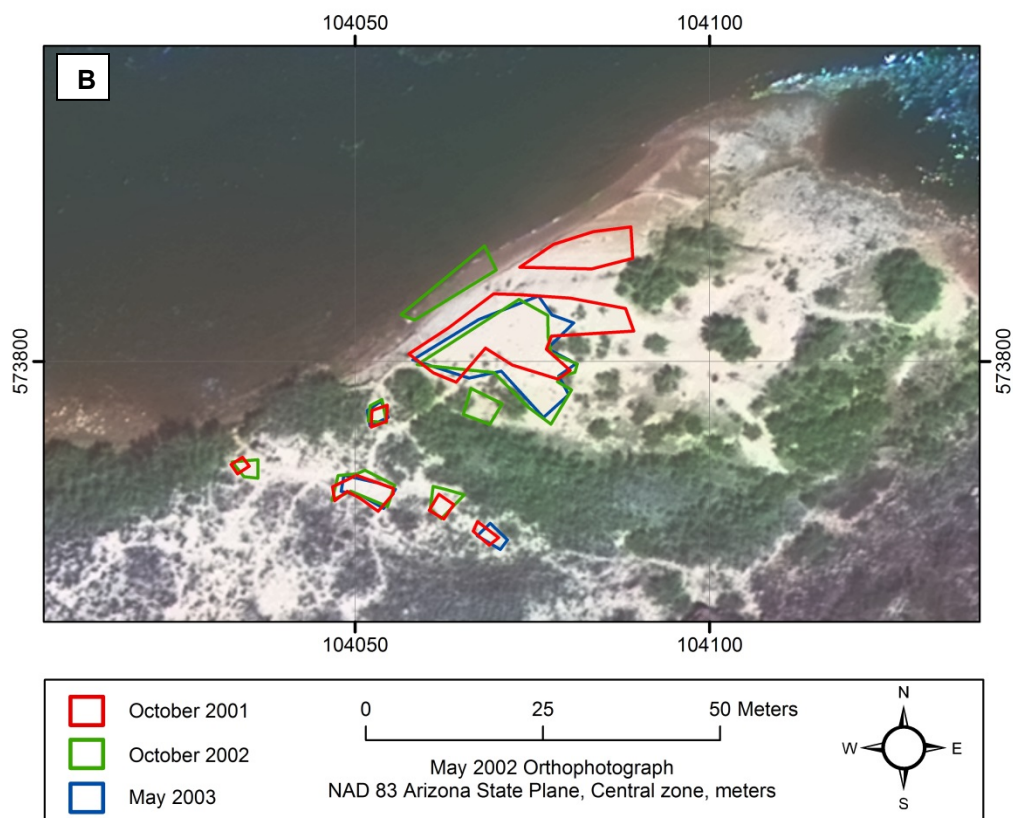
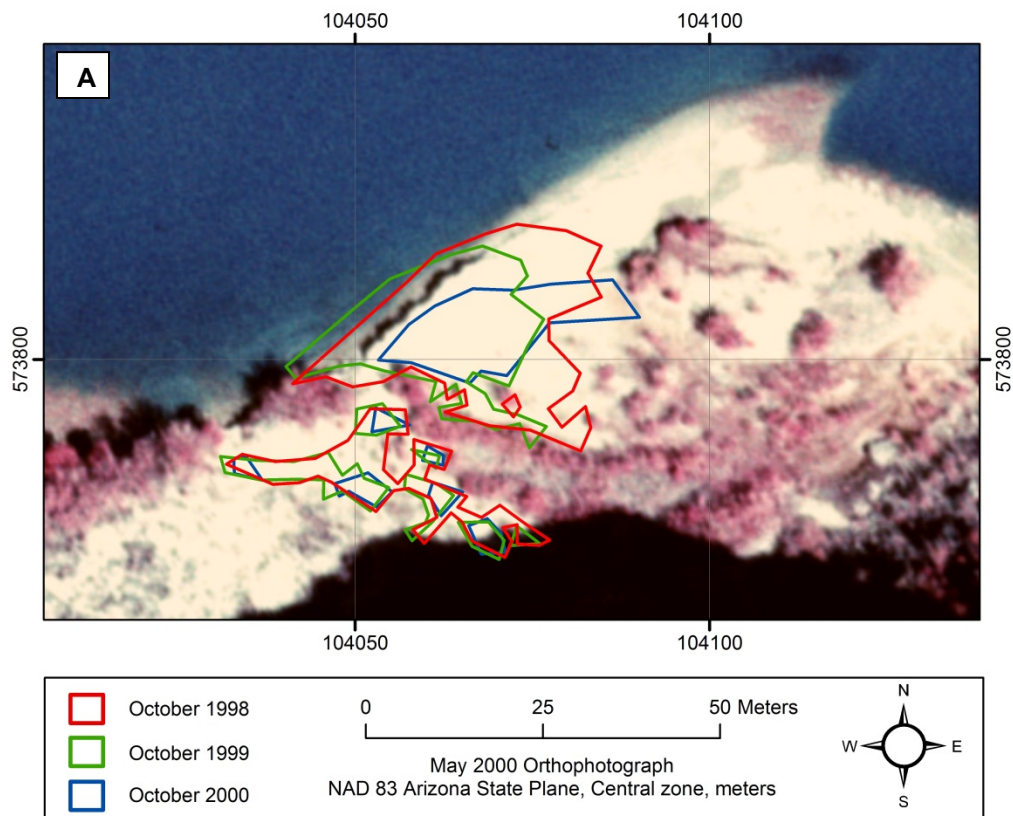
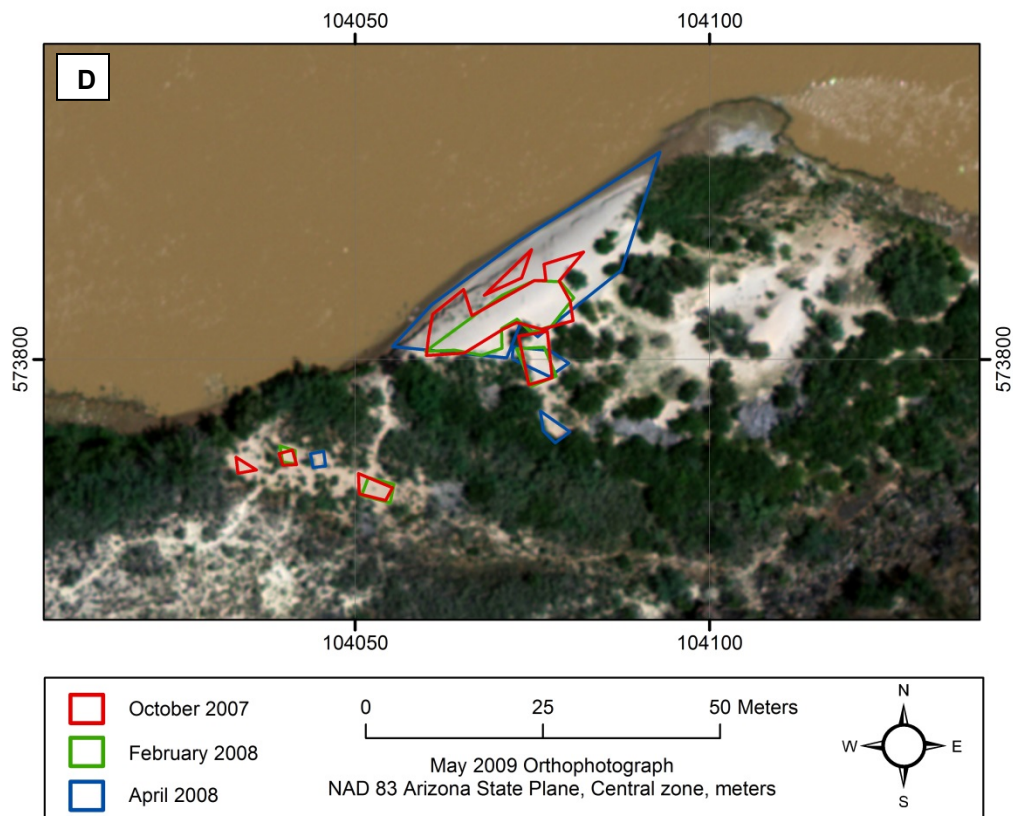
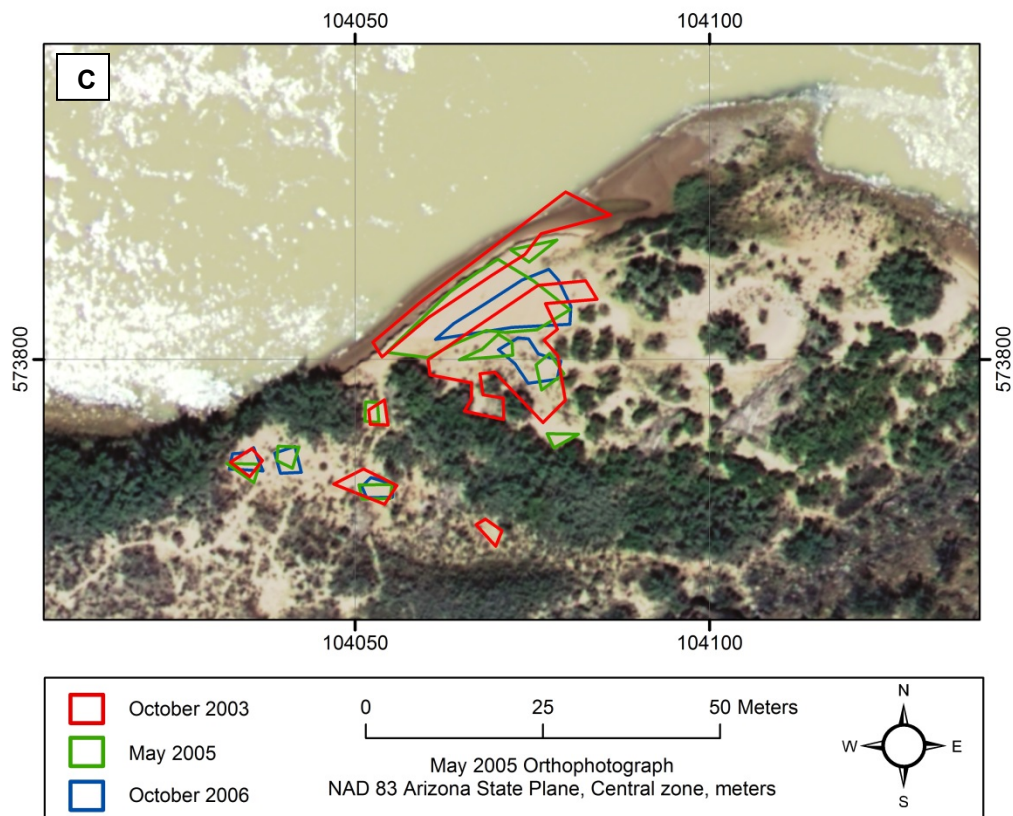


Figure A121. Time series plot showing campsite area at 183 Mile Left camp (River Mile 183.3L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A32 for data.





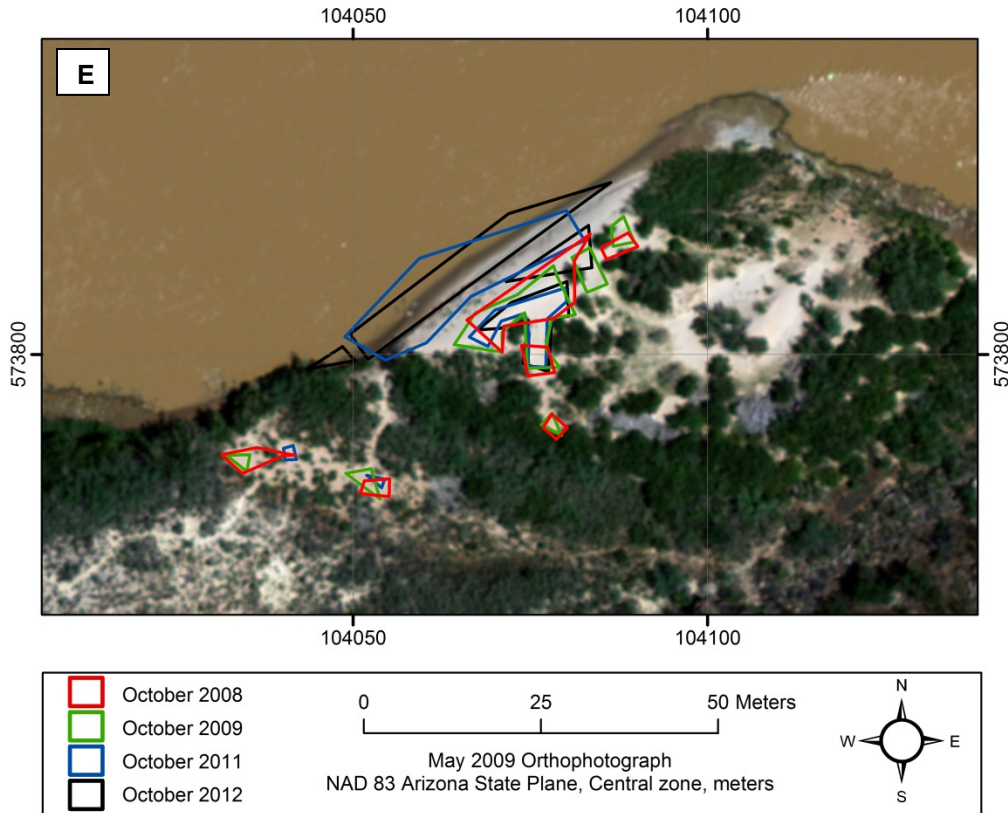


Figure A122. Maps showing campsite areas measured at 183 Mile Left camp (River Mile 183.3L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A123. Remote camera photograph showing 183 Mile Left located at River Mile 183.3L. Flow in main channel is from left to right. Photograph taken on October 8, 2012.

Campsite Name: 183 Mile Right

River Mile: 183.3, River Right

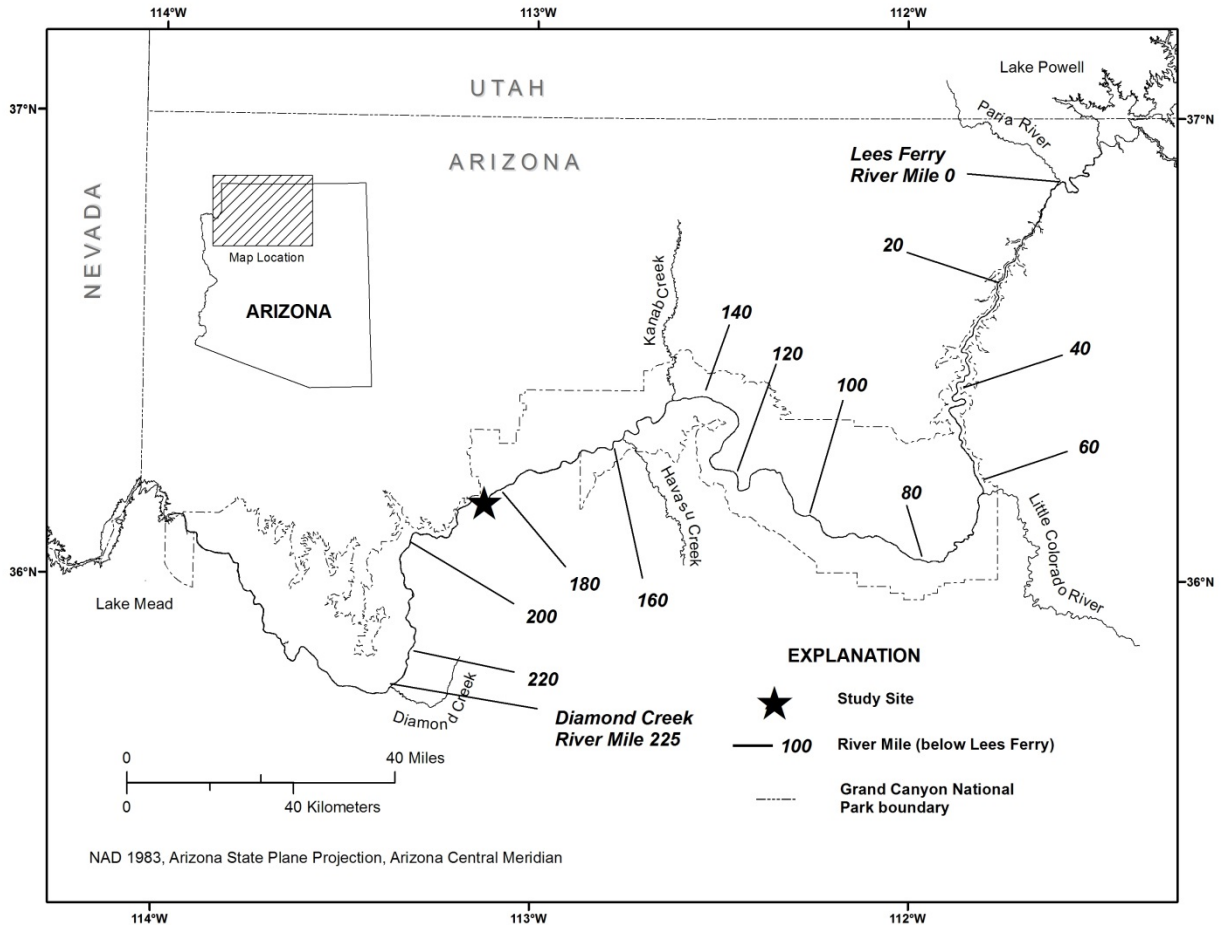


Figure A124. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 183 Mile Right camp study site (River Mile 183.3R).

Table A33. Campsite area in different stage-elevation zones at 183 Mile Right camp (River Mile 183.3R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/21/1998		27	250	0	0	148	277	148	425
10/13/1999		0	359	0	0	136	359	136	495
10/25/2000	0	212	282	71	0	121	494	192	686
10/21/2001	204	0	7	42	0	104	7	146	153
10/5/2002	321	8	0	30	4	51	8	85	93
5/10/2003	195	37	0	0	0	48	37	48	85
10/4/2003	160	156	0	0	0	65	156	65	221
5/21/2005	0	89	0	0	80	65	89	145	234
10/20/2006	115	2	0	0	12	28	2	40	42
10/27/2007	214	47	0	0	0	26	47	26	73
2/15/2008	0	0	0	0	0	0	0	0	0
4/11/2008	0	9	8	14	23	0	17	37	54
10/24/2008	0	0	0	0	6	0	0	6	6
10/23/2009	270	0	0	0	0	0	0	0	0
10/18/2011		0	0	0	0	0	0	0	0
10/17/2012	534	247	0	0	0	9	247	9	256

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

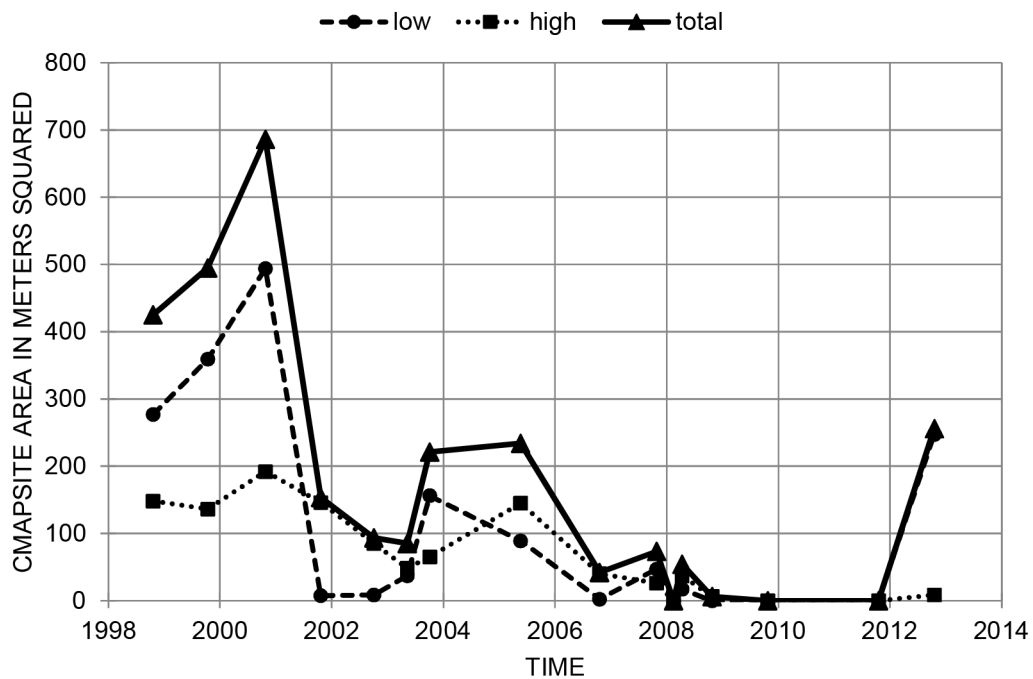
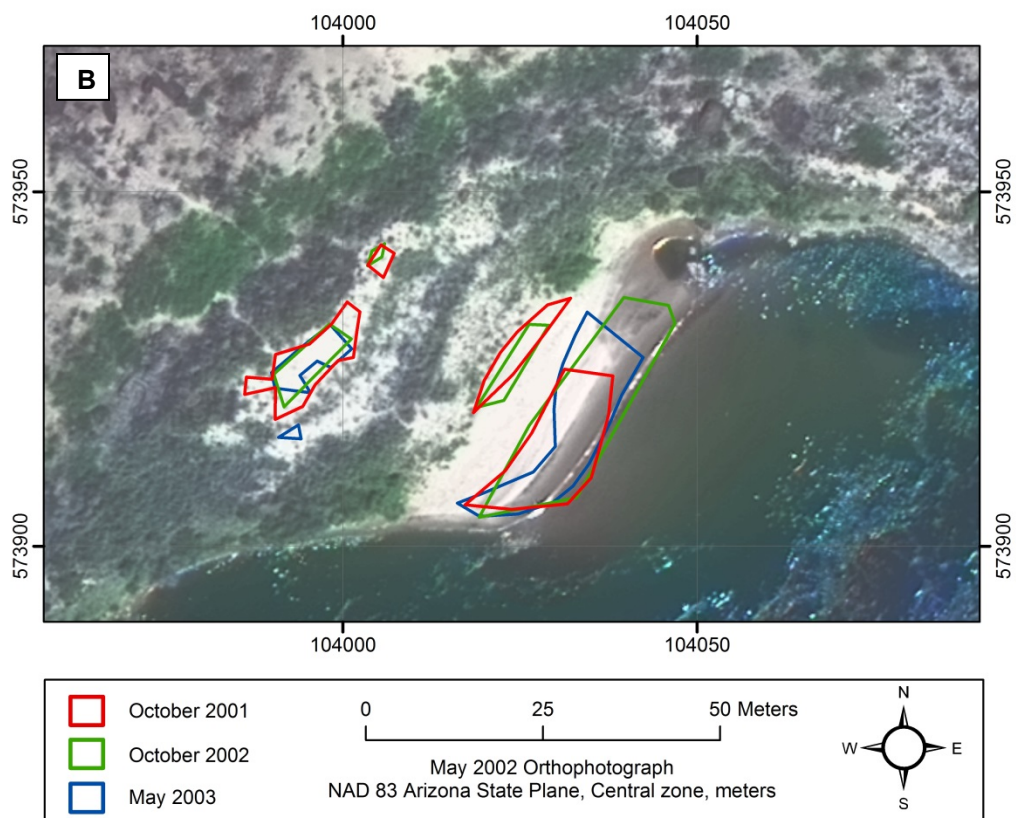
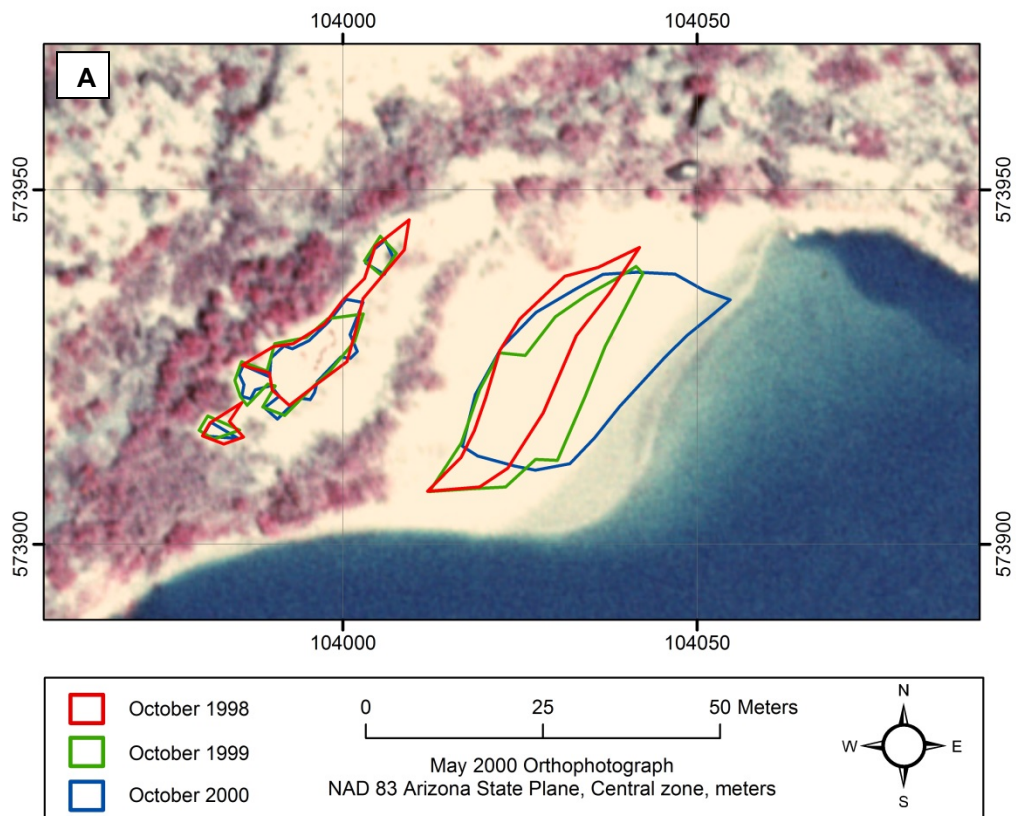
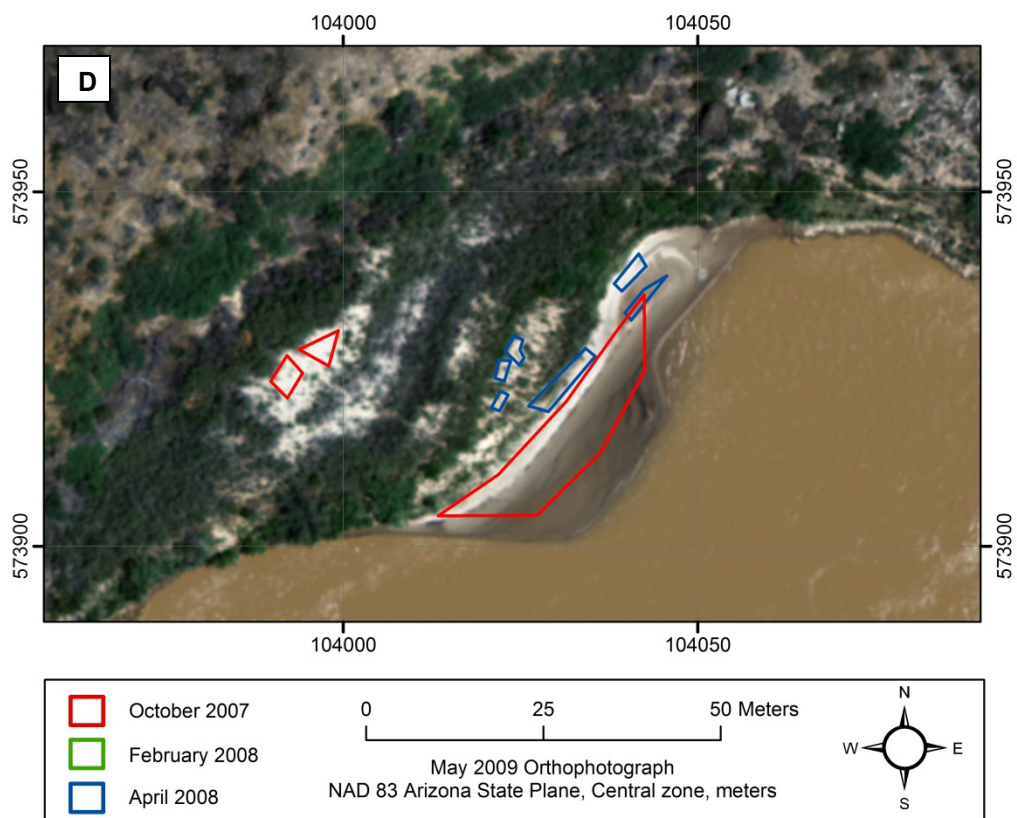
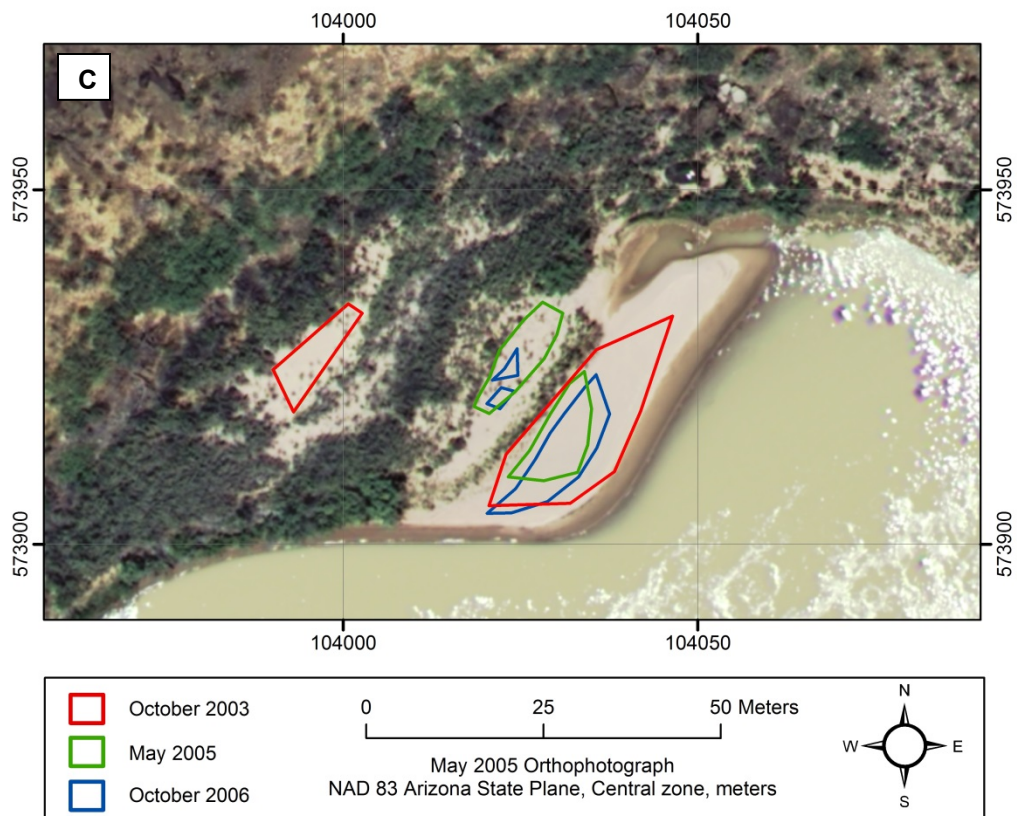


Figure A125. Time series plot showing campsite area at 183 Mile Right camp (River Mile 183.3R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A33 for data.





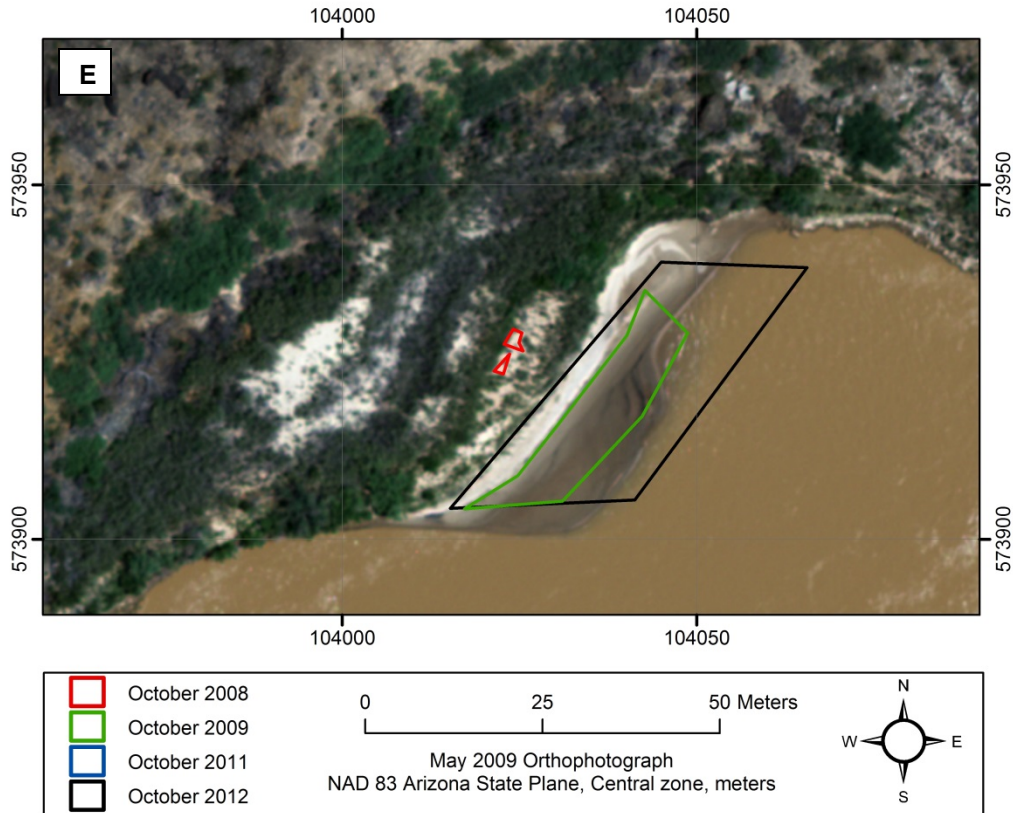


Figure A126. Maps showing campsite areas measured at 183 Mile Right camp (River Mile 183.3R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A127. Remote camera photograph showing 183 Mile Right camp at River Mile 183.3R. Flow in main channel is from left to right. (A) Photograph taken on January 1, 1999; (B) Photograph taken on October 8, 2012.

Campsite Name: 194 Mile

River Mile: 194.6, River Left

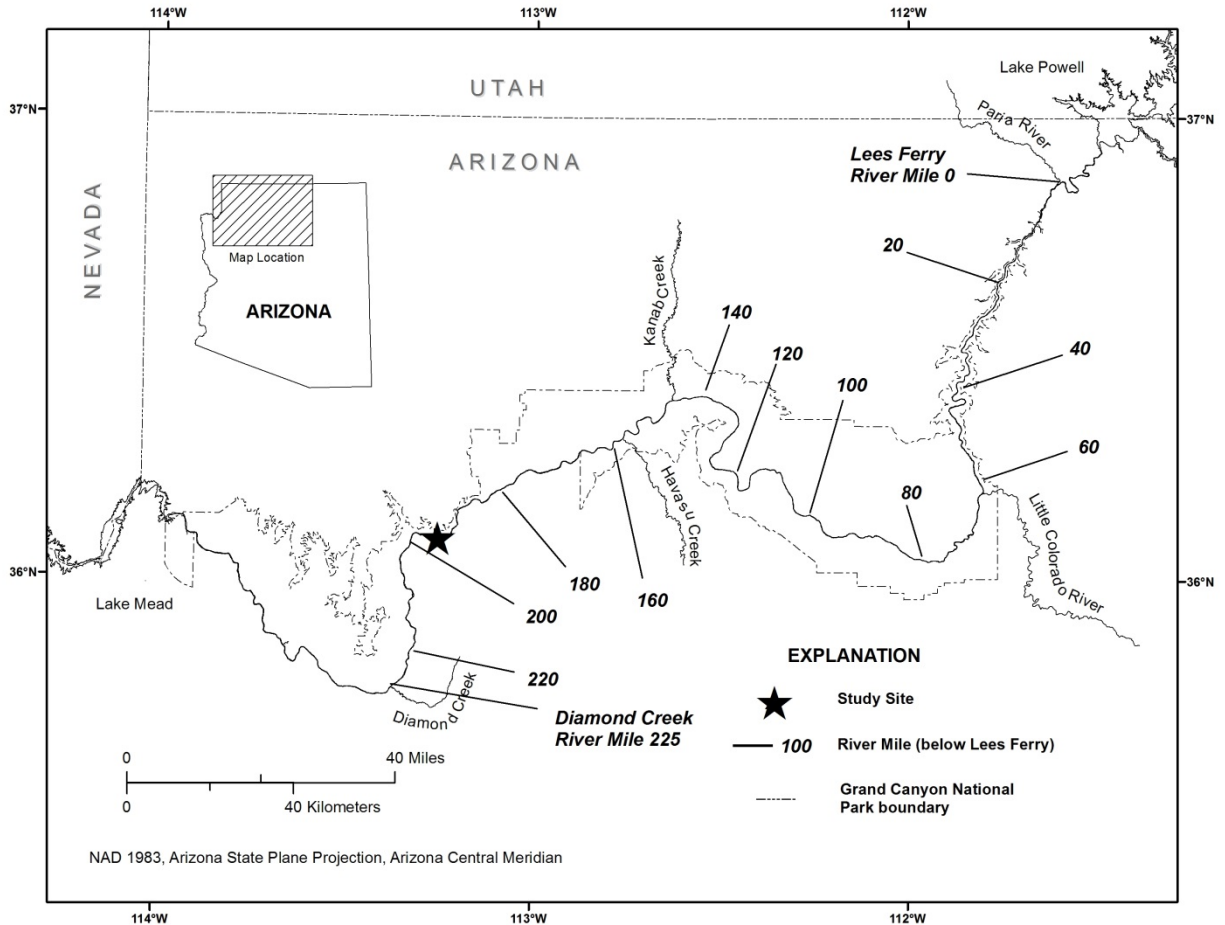


Figure A128. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 194 Mile camp study site (River Mile 194.6L).

Table A34. Campsite area in different stage-elevation zones at 194 Mile camp (River Mile 194.6L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/21/1998		0	0	4	587	532	0	1123	1123
10/14/1999		0	0	27	396	393	0	816	816
10/26/2000	10	68	98	96	337	335	166	768	934
10/17/2001	0	0	0	3	38	556	0	597	597
10/5/2002	0	0	0	0	344	379	0	723	723
5/10/2003	9	230	0	25	304	258	230	587	817
10/3/2003	0	0	0	0	252	259	0	511	511
5/21/2005	43	326	15	0	238	238	341	476	817
10/21/2006	202	30	12	38	170	201	42	409	451
10/27/2007	141	86	5	28	110	171	91	309	400
2/16/2008	0	77	8	34	176	283	85	493	578
4/11/2008	0	0	0	0	282	299	0	581	581
10/24/2008	14	270	0	0	248	69	270	317	587
10/24/2009	118	31	28	0	171	159	59	330	389
10/18/2011		2	86	0	101	12	87	114	201
10/17/2012	177	154	0	0	83	31	154	113	267

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

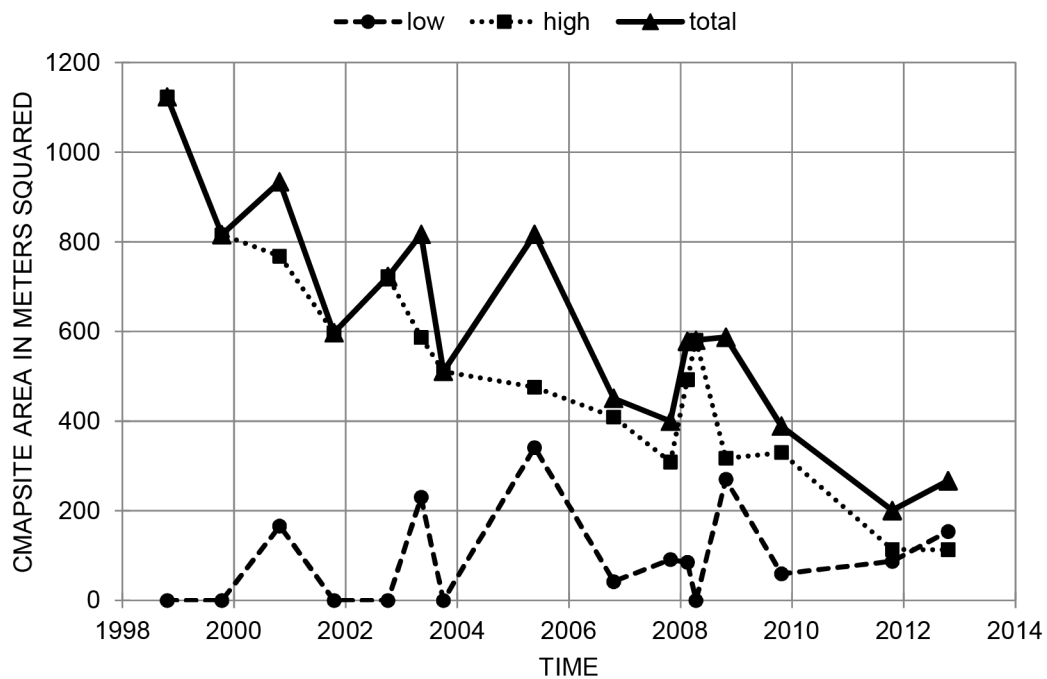
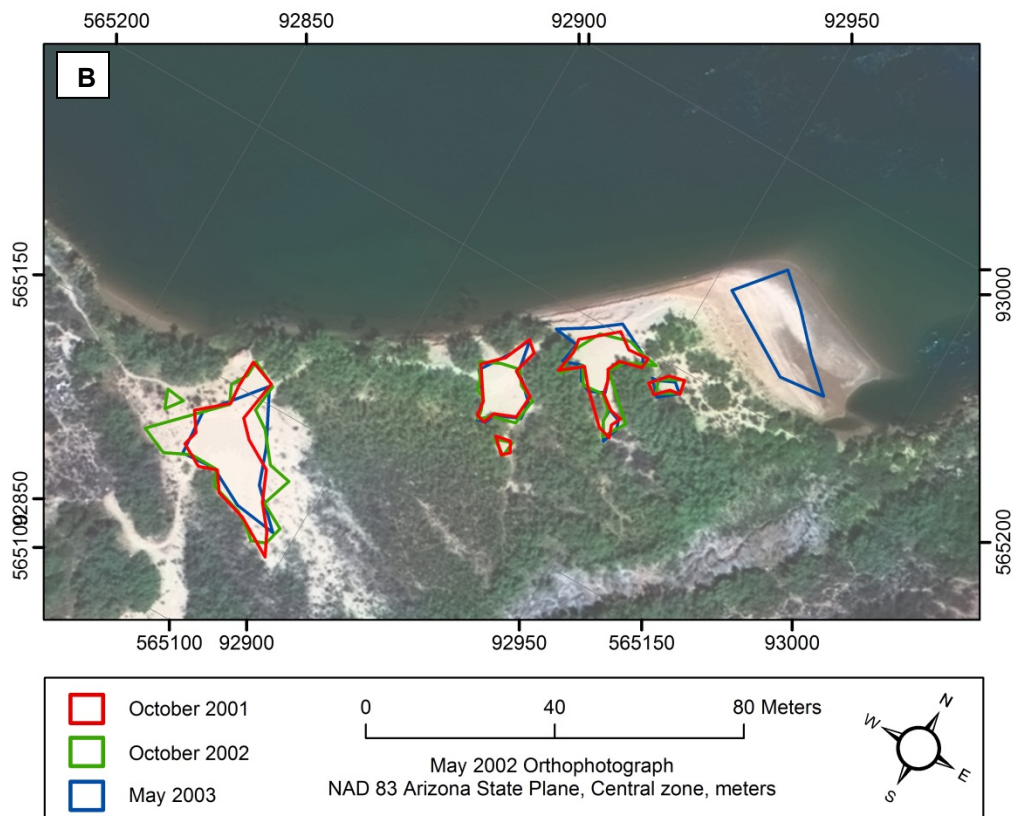
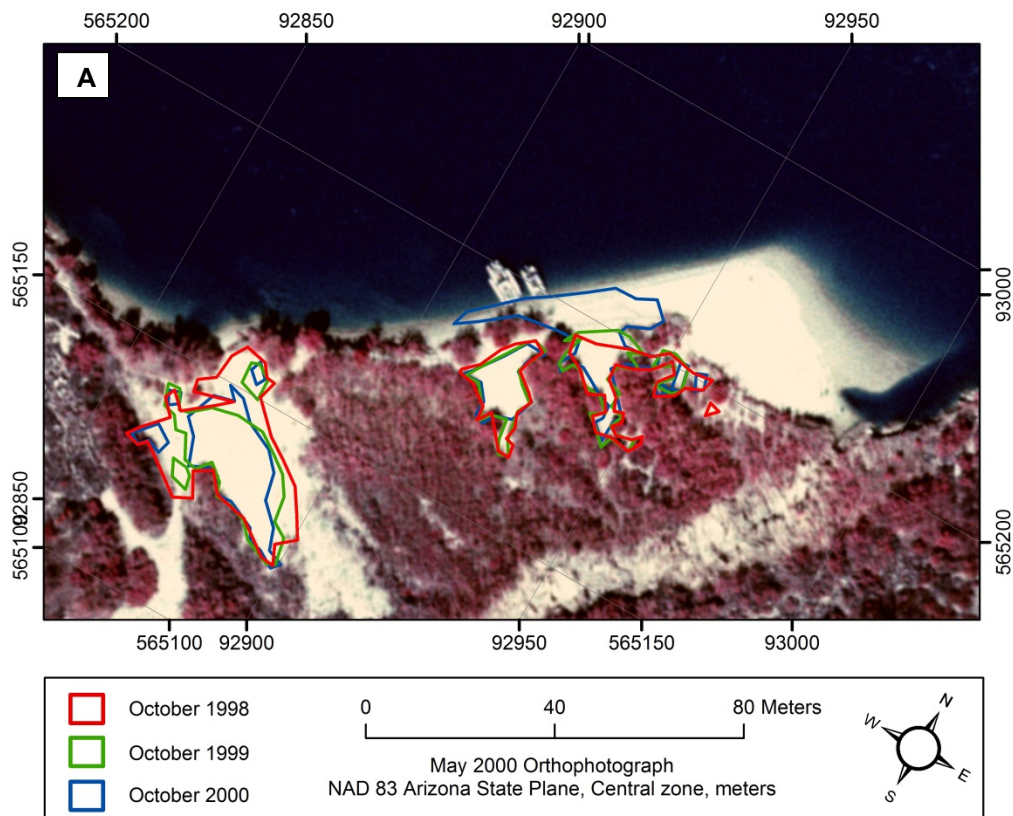
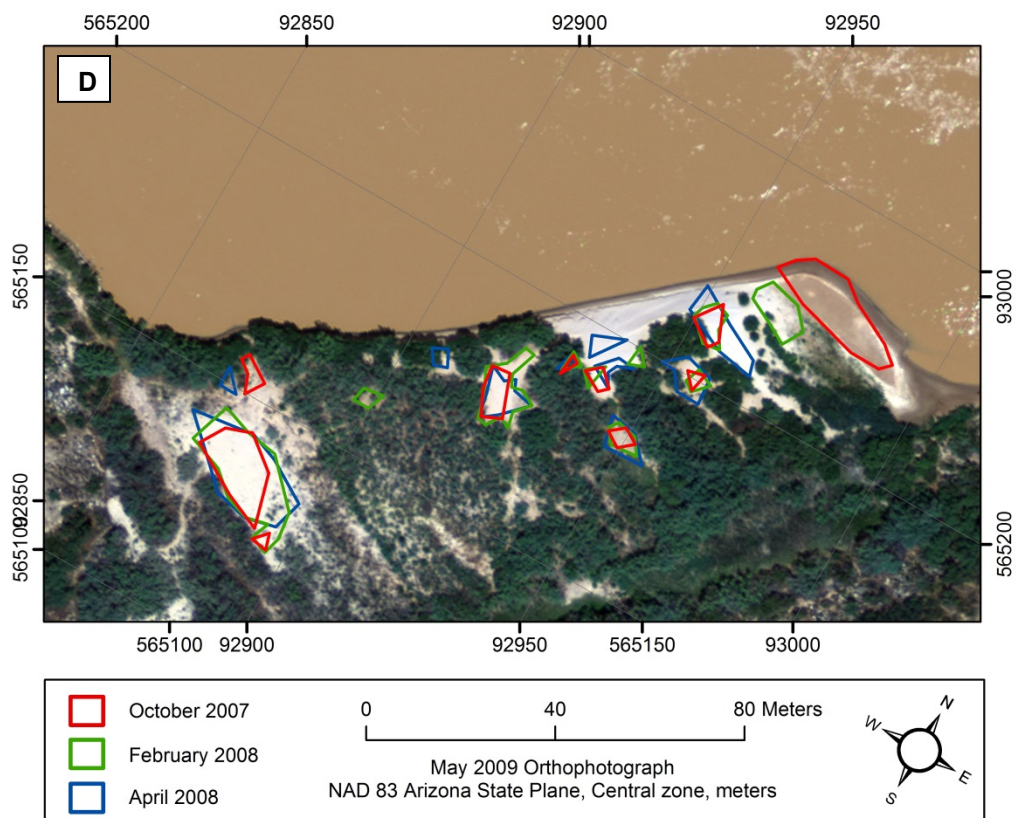
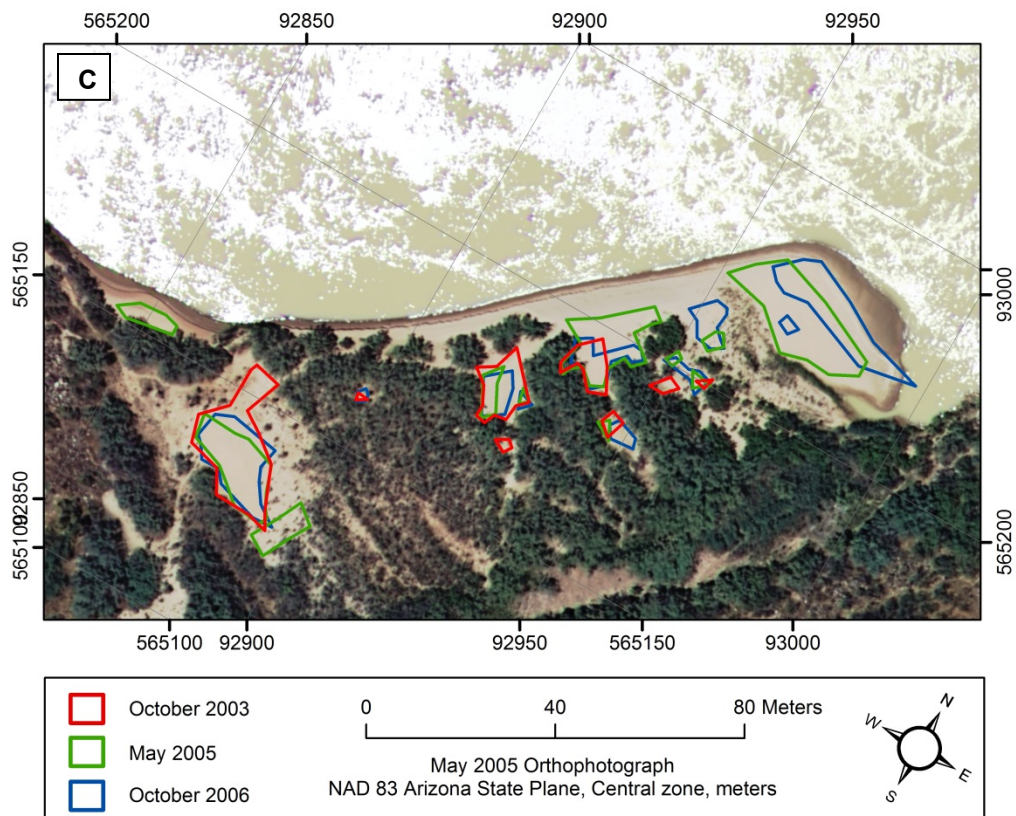


Figure A129. Time series plot showing campsite area at 194 Mile camp (River Mile 194.6L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A34 for data.





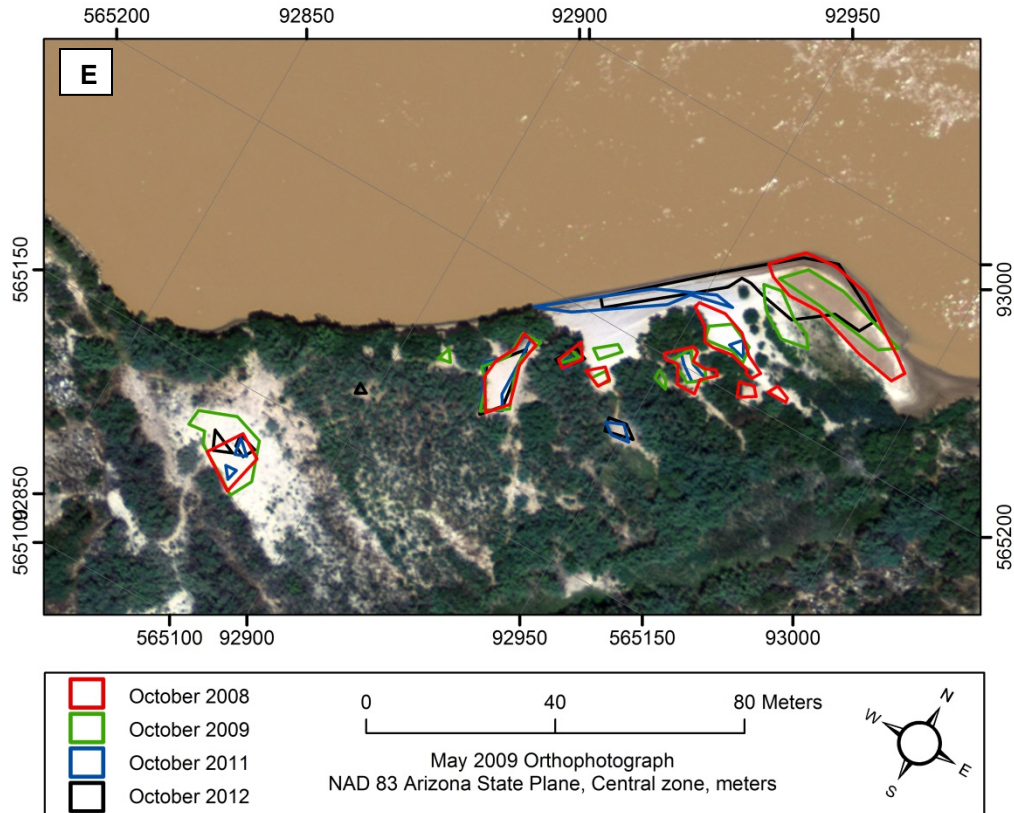


Figure A130. Maps showing campsite areas measured at 194 Mile camp (River Mile 194.6L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A131. Remote camera photograph showing 194 Mile camp at River Mile 194.6L. Flow in main channel is from bottom to top. (A) Photograph taken on September 11, 1998; (B) Photograph taken on October 17, 2012.

Campsite Name: 202 Mile

River Mile: 202.3, River Right

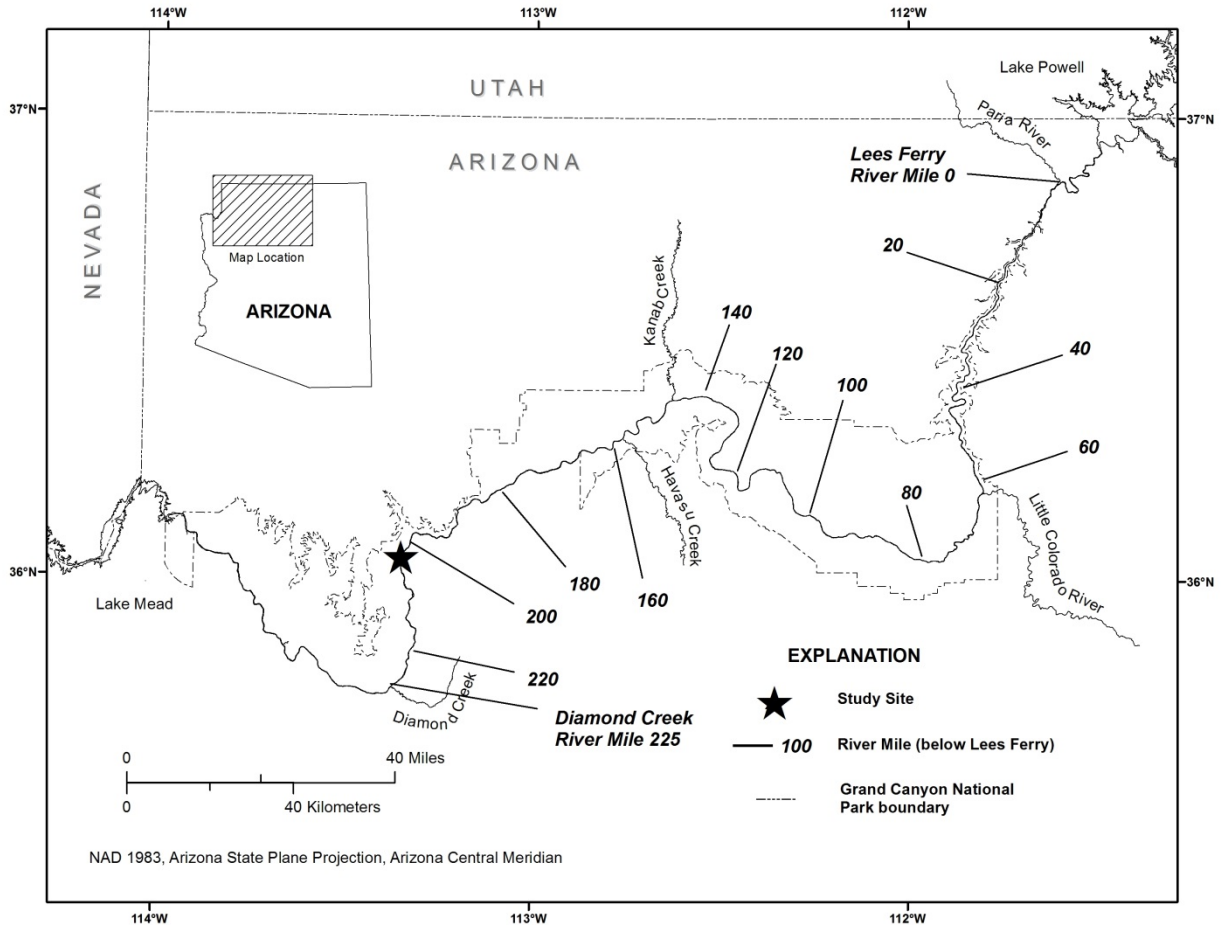


Figure A132. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the 202 Mile camp study site (River Mile 202.3R).

Table A35. Campsite area in different stage-elevation zones at 202 Mile camp (River Mile 202.3R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/22/1998		37	525	226	106	315	562	647	1209
10/15/1999		0	669	313	144	284	669	741	1410
10/26/2000	45	323	188	271	70	188	511	529	1040
10/17/2001	0	228	526	354	150	257	754	761	1515
10/6/2002	340	510	416	101	127	212	926	440	1366
5/10/2003	0	176	340	24	67	265	516	356	872
10/4/2003	0	357	301	15	80	245	658	340	998
5/21/2005	50	603	537	487	86	220	1140	793	1933
10/21/2006	0	236	150	99	93	266	386	458	844
10/27/2007	44	45	0	6	44	80	45	130	175
2/16/2008	0	384	114	3	41	102	498	146	644
4/11/2008	0	15	143	157	260	181	158	598	756
10/25/2008	50	77	8	0	131	142	85	273	358
10/24/2009	131	226	0	0	155	127	226	282	508
10/19/2011		123	168	11	70	121	291	201	492
10/18/2012	328	269	15	0	47	105	284	152	436

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

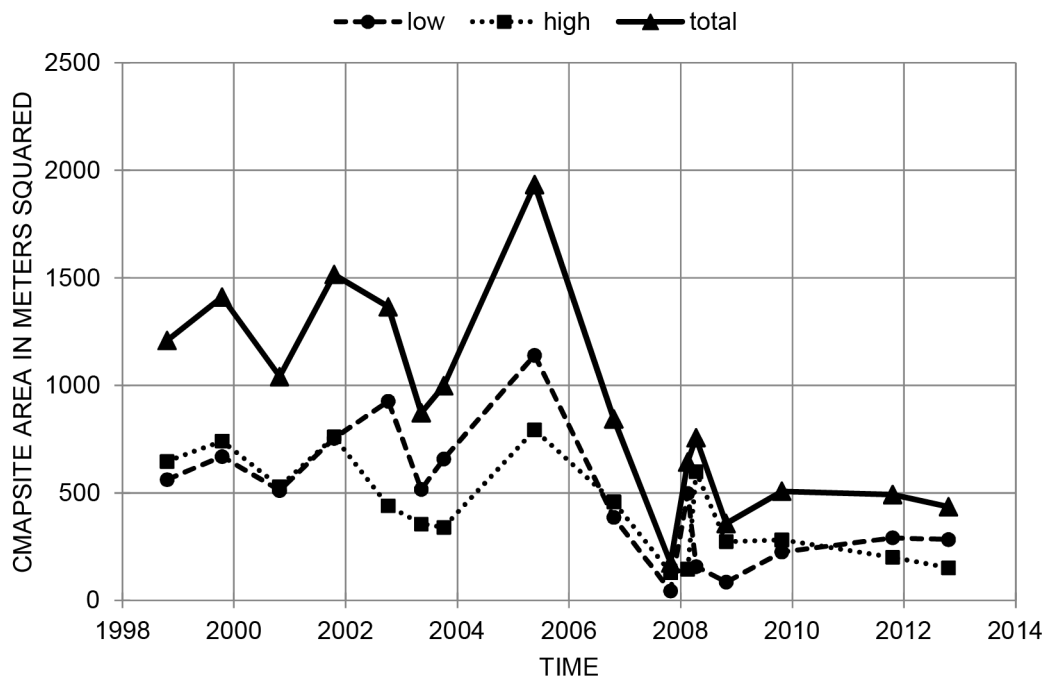
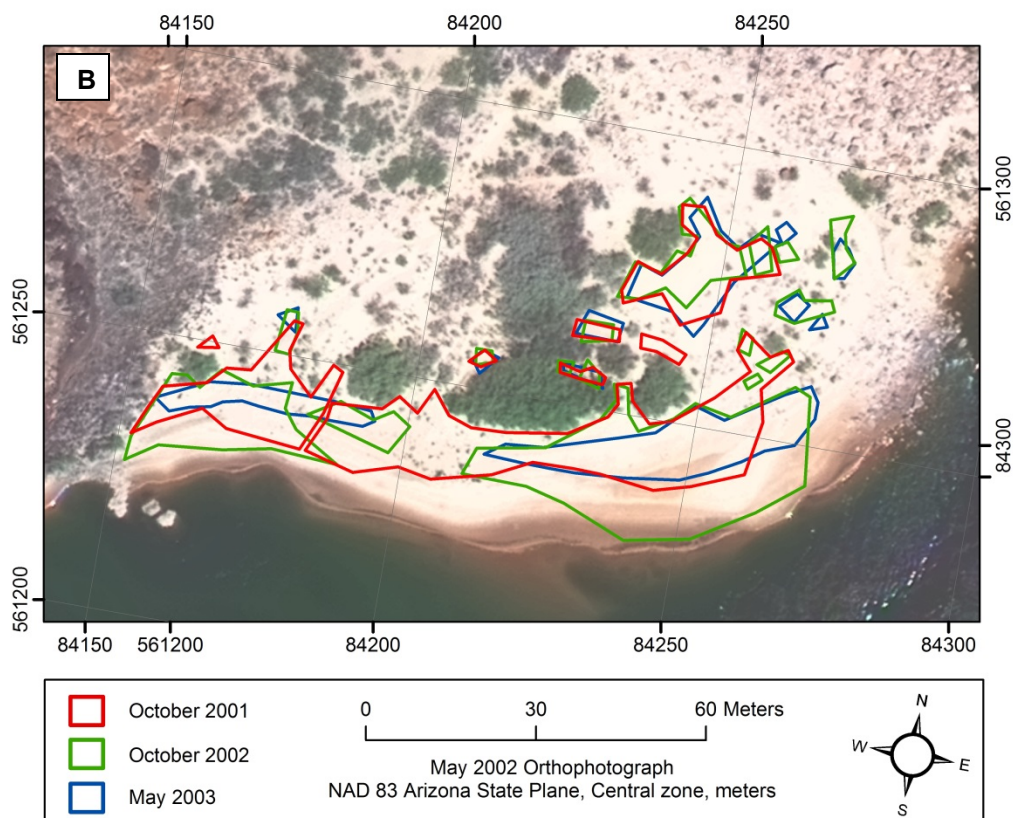
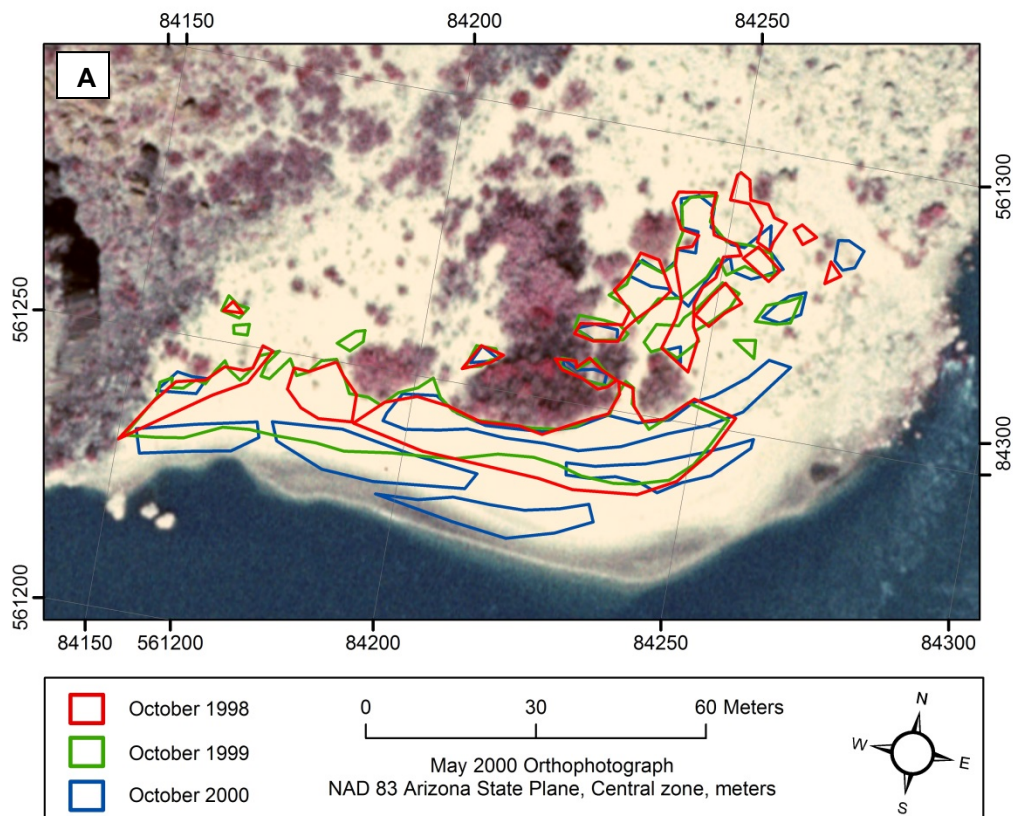
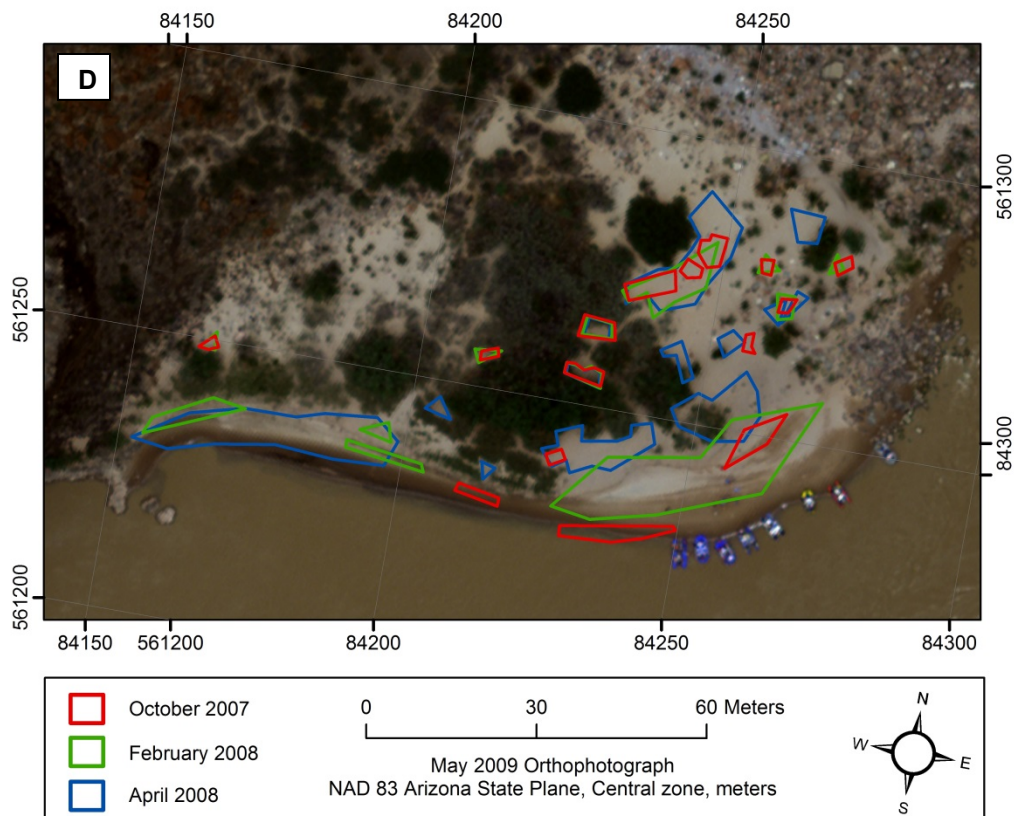
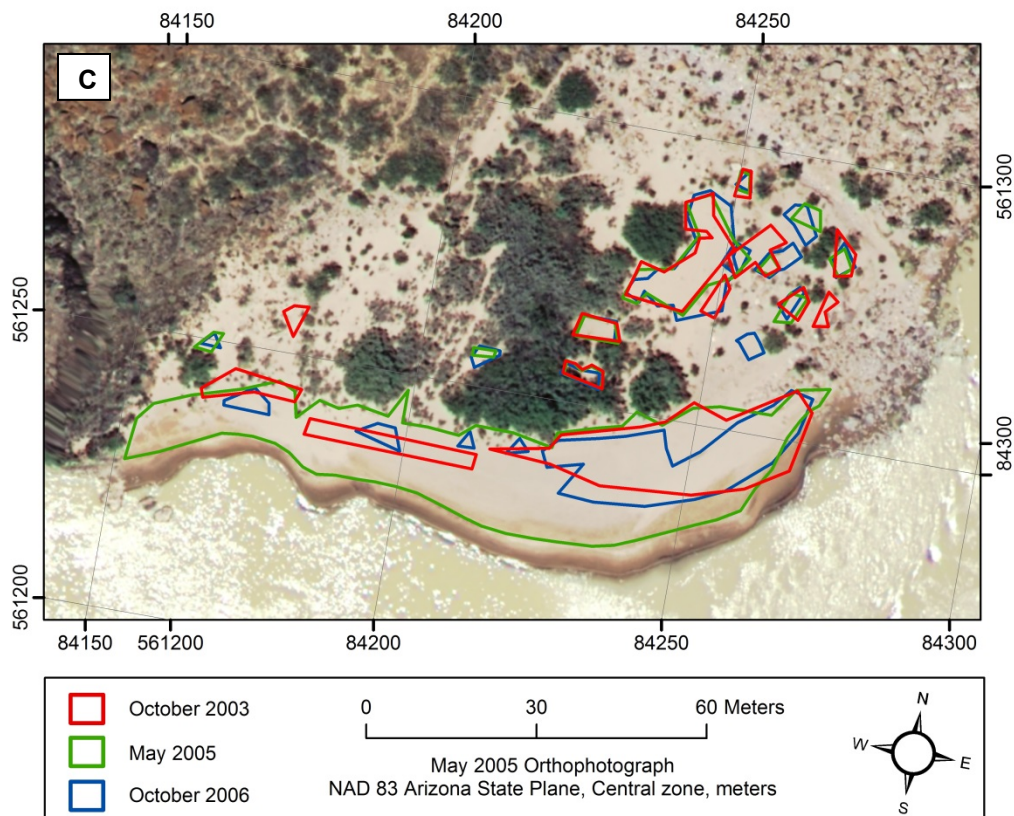


Figure A133. Time series plot showing campsite area at 202 Mile camp (River Mile 202.3R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A35 for data.





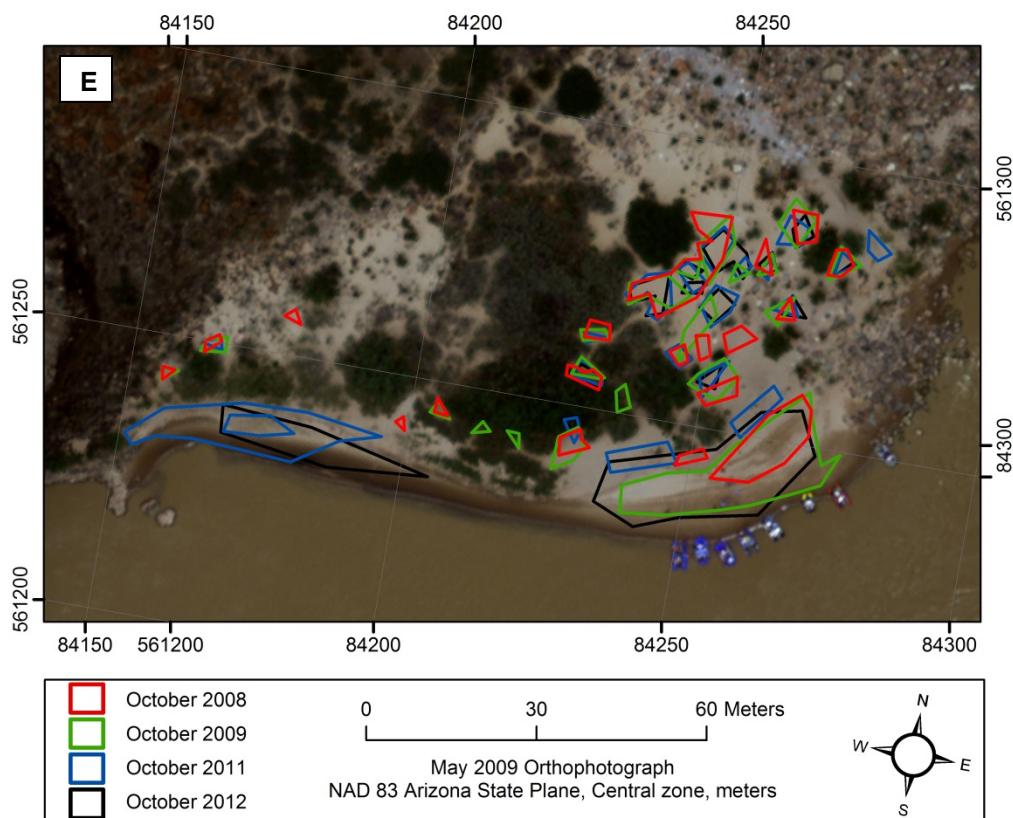


Figure A134. Maps showing campsite areas measured at 202 Mile camp (River Mile 202.3R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A135. Remote camera photographs showing 202 Mile camp at River Mile 202.3R. Flow in main channel is from right to left. (A) Photograph taken on May 31, 1998; (B) Photograph taken on July 25, 2012.

Campsite Name: Pumpkin Springs

River Mile: 213.3, River Left

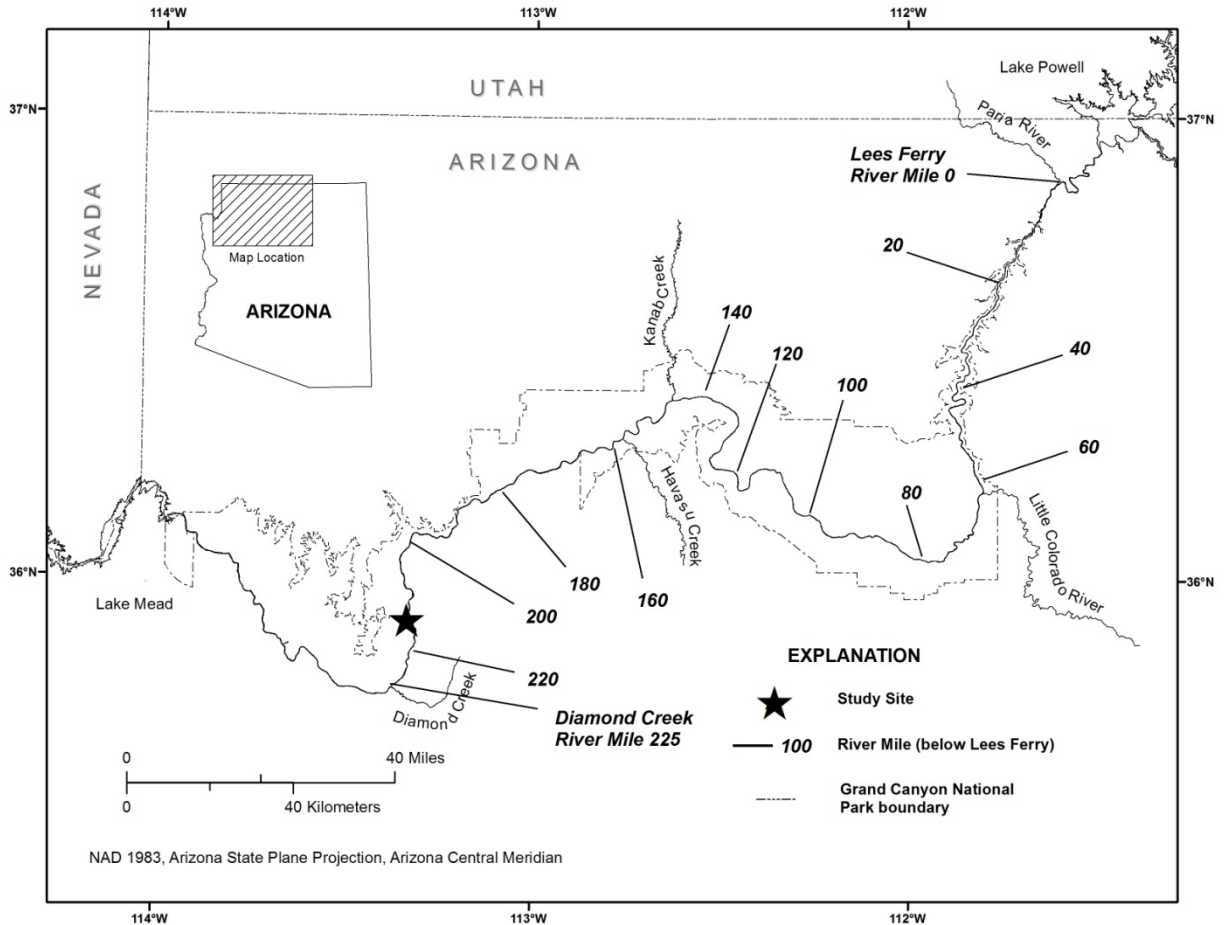


Figure A136. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Pumpkin Springs camp study site (River Mile 213.3L).

Table A36. Campsite area within different stage-elevation zones at Pumpkin Springs camp (River Mile 213.3L) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/22/1998		0	17	62	120	233	17	415	432
10/14/1999		0	28	59	47	115	28	221	249
10/27/2000	105	344	188	82	10	40	532	132	664
10/18/2001	340	440	0	49	5	23	440	77	517
10/6/2002	63	524	9	36	3	5	533	44	577
5/11/2003	78	681	50	52	1	11	731	64	795
10/5/2003	84	591	52	15	0	0	643	15	658
5/22/2005	26	234	162	20	8	0	396	28	424
10/22/2006	105	203	54	25	11	0	257	36	293
10/28/2007	37	256	23	1	8	8	279	17	296
2/13/2008	0	179	59	54	18	4	238	76	314
4/12/2008	0	13	93	117	305	22	106	444	550
10/26/2008	0	6	5	29	288	7	11	324	335
10/25/2009	141	13	33	45	326	33	46	405	451
10/20/2011		27	96	27	92	4	123	122	245
10/18/2012	341	18	2	13	48	29	20	90	109

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

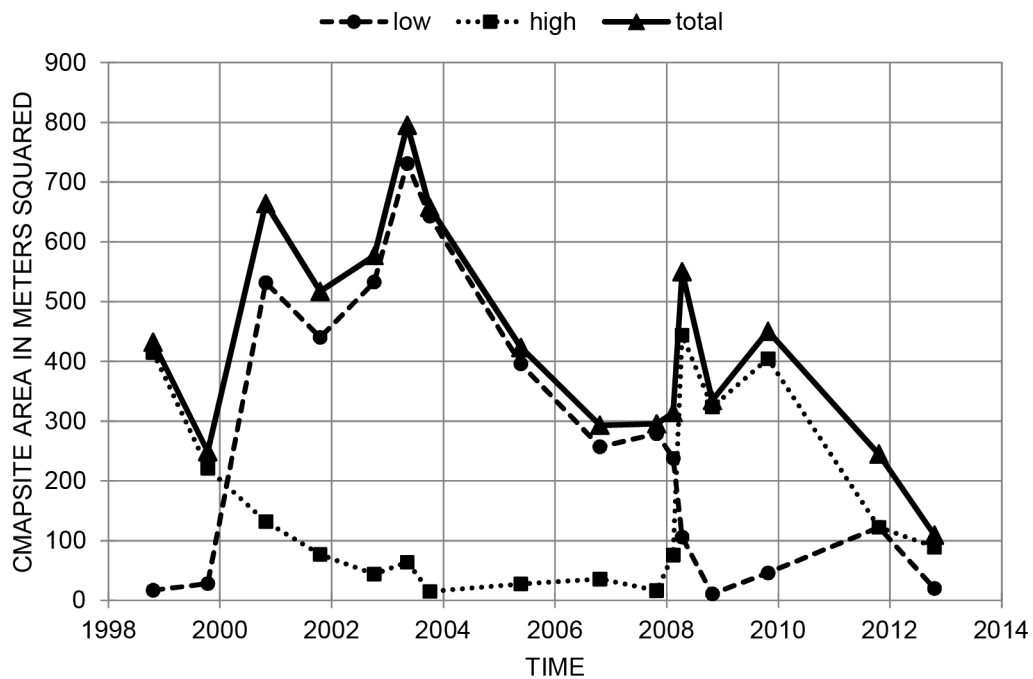
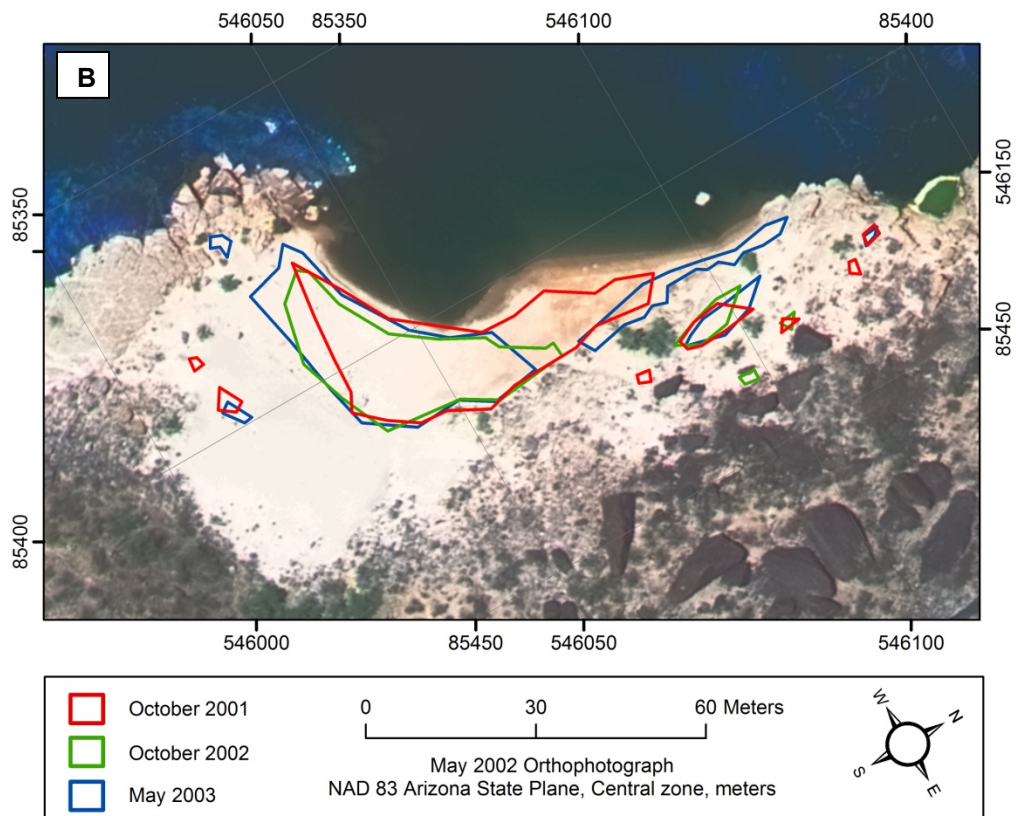
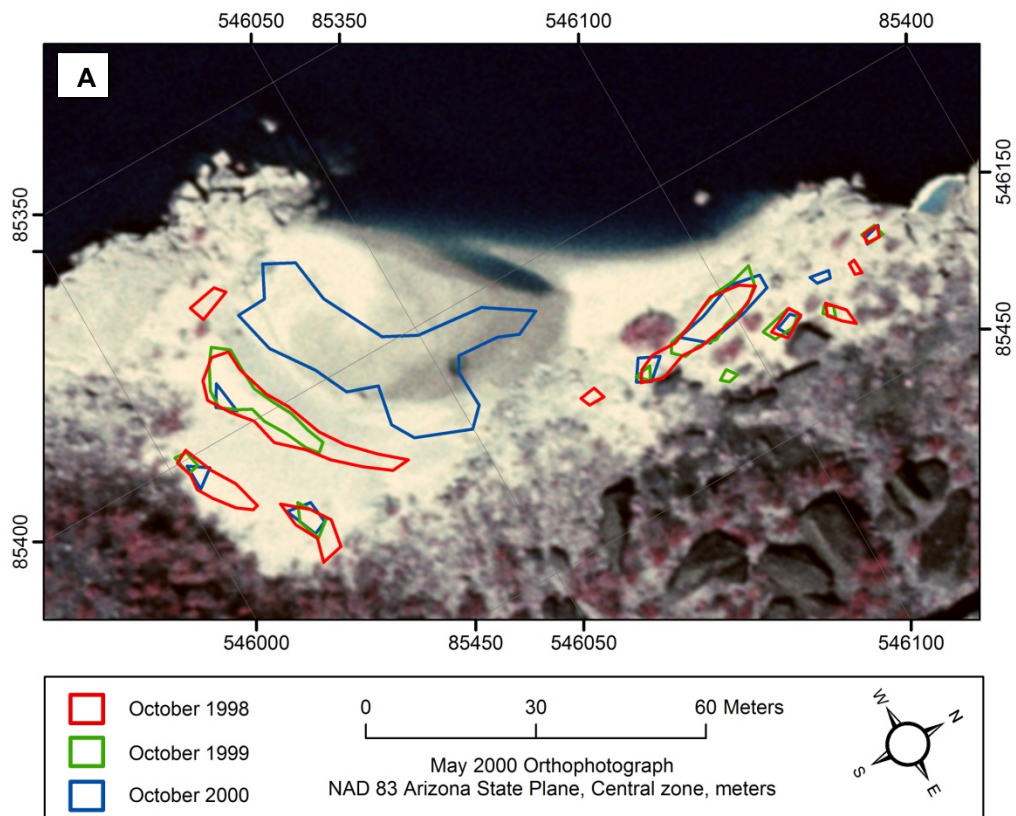
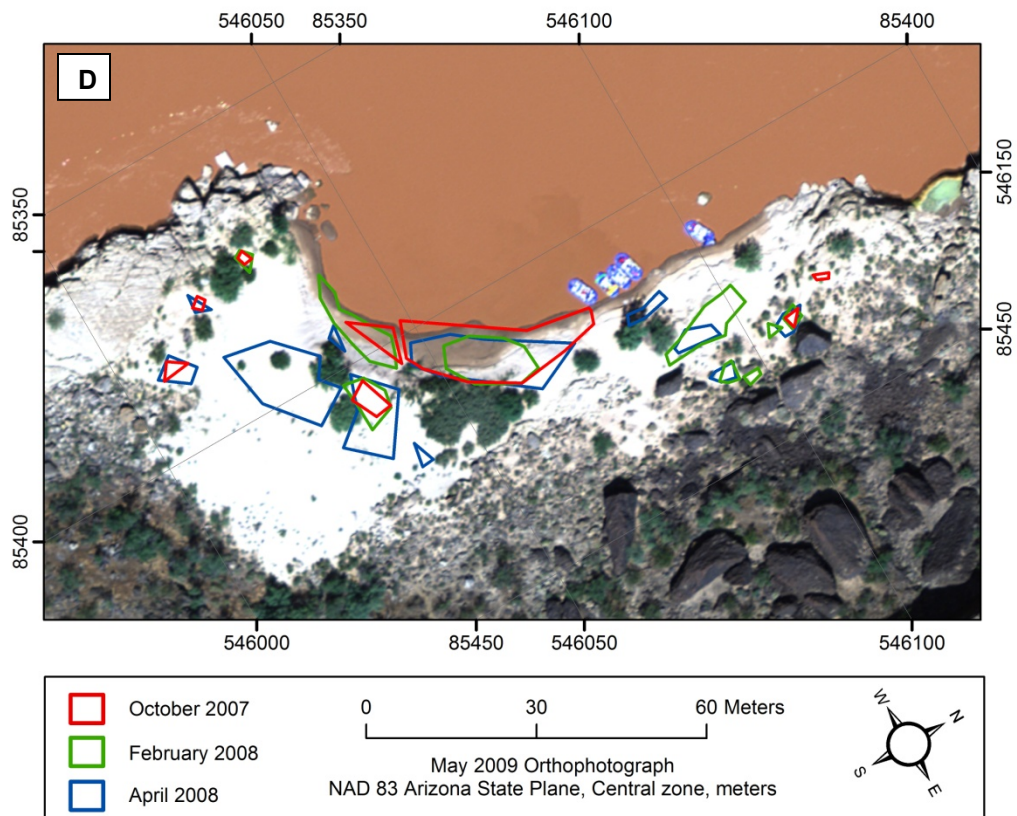
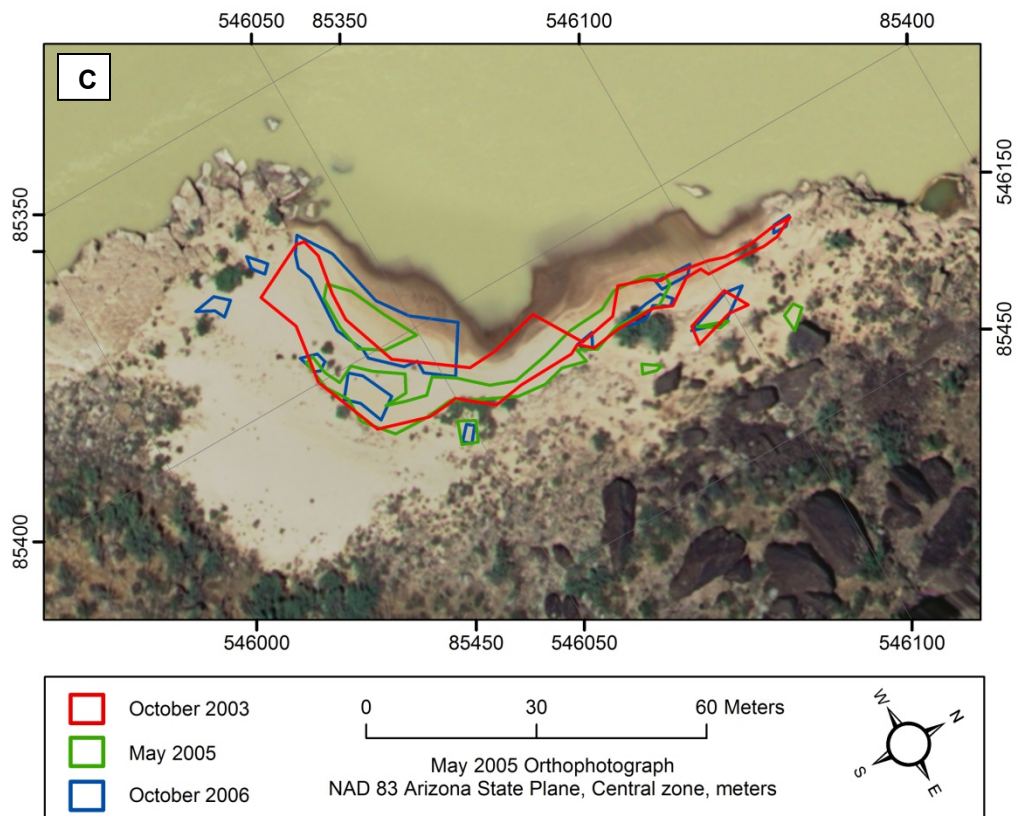


Figure A137. Time series plot showing campsite area at Pumpkin Springs camp (River Mile 213.3L) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A36 for data.





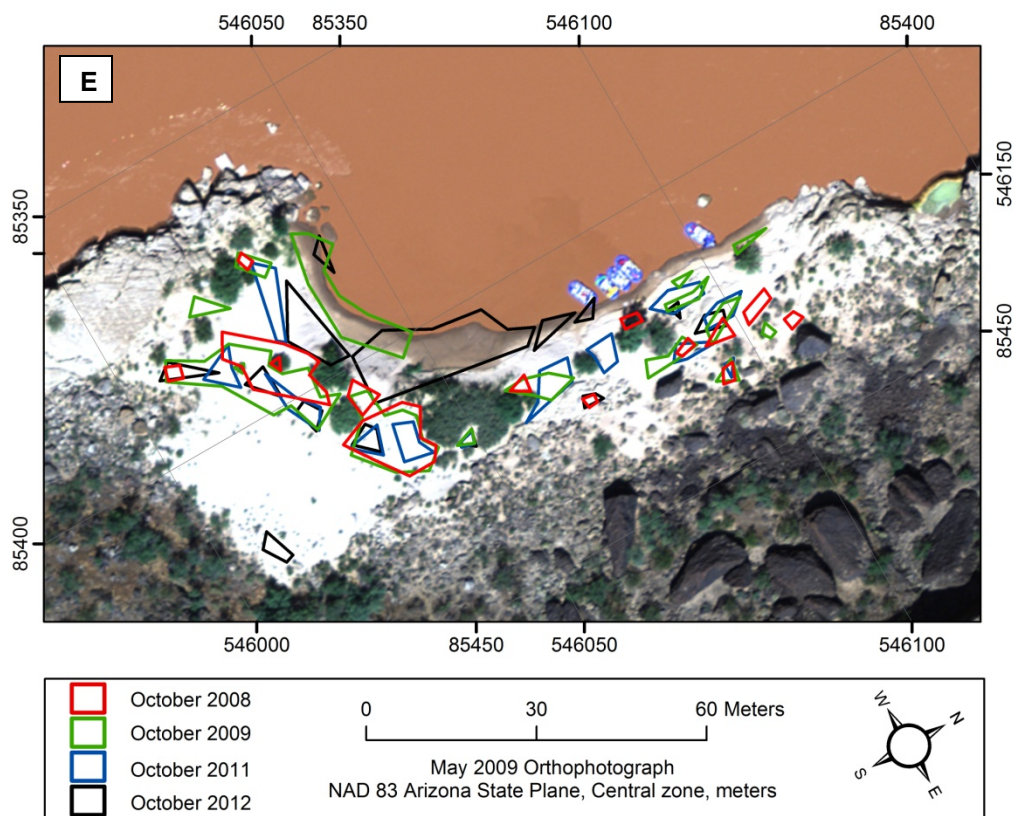


Figure A138. Maps showing campsite areas measured at Pumpkin Springs camp (River Mile 213.3L) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.



Figure A139. Remote camera photographs showing Pumpkin Springs camp at River Mile 213.3L. Flow in main channel is from left to right. (A) Photograph taken on July 9, 1998; (B) photograph taken on November 2, 2008.

Campsite Name: Middle 220 Mile

River Mile: 220.1, River Right

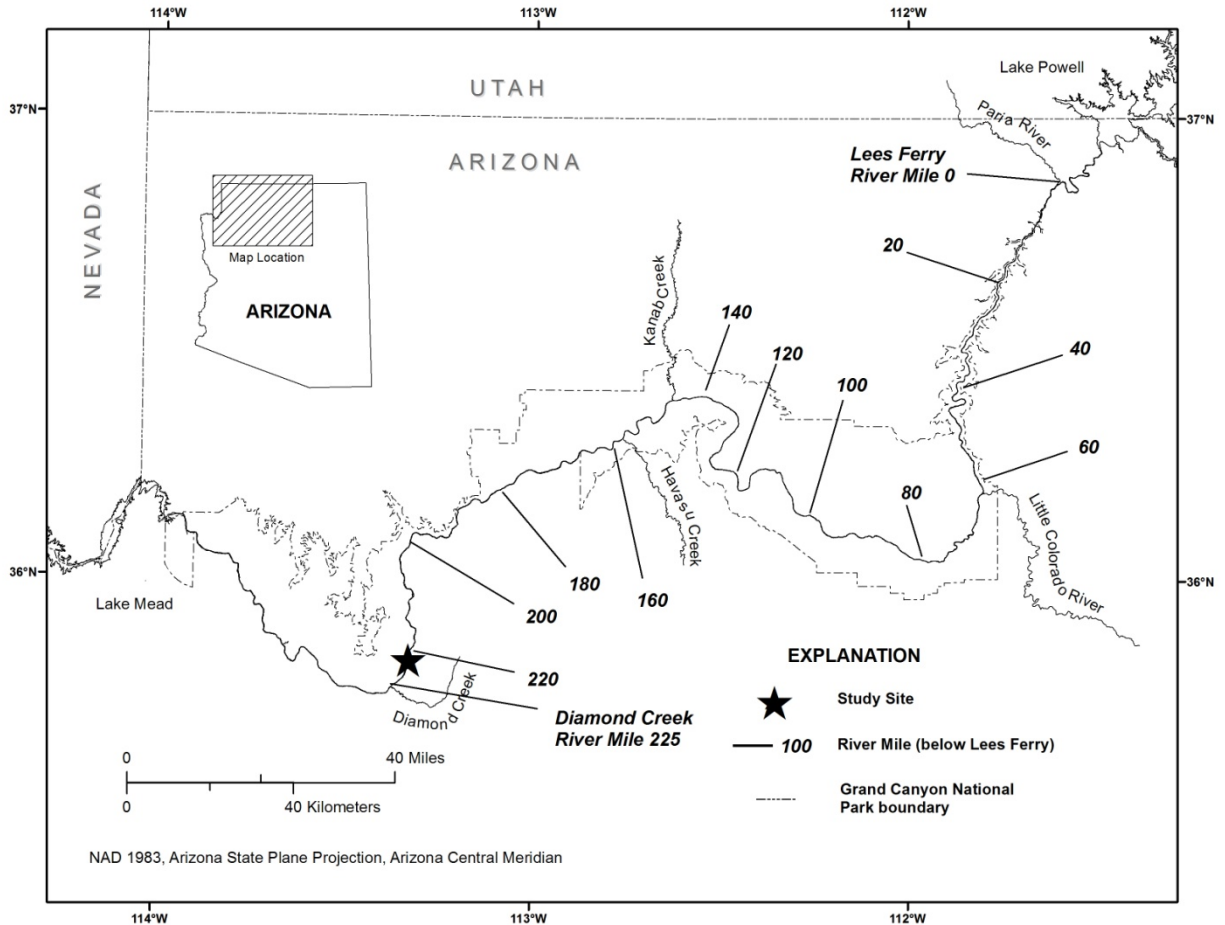


Figure A140. Colorado River corridor between Glen Canyon Dam and the western boundary of Grand Canyon National Park and the location of the Middle 220 Mile camp study site (River Mile 220.1R).

Table A37. Campsite area in different stage-elevation zones at Middle 220 Mile camp (River Mile 220.1R) from 1998 to 2012.

[Surveys that did not measure campsite area at a given stage-elevation zone are indicated with blank entries]

Survey Date	Campsite area								
	Stage-elevation zones ¹								
	10-15 (m ²)	15-20 (m ²)	20-25 (m ²)	25-30 (m ²)	30-45 (m ²)	above 45 (m ²)	low (m ²)	high (m ²)	total (m ²)
10/22/1998		0	0	2	832	766	0	1600	1600
10/14/1999		0	0	0	686	423	0	1109	1109
10/27/2000	0	0	1	243	437	383	1	1063	1064
10/18/2001	0	0	3	100	465	592	3	1157	1160
10/6/2002	0	0	0	1	381	248	0	630	630
5/12/2003	1	105	2	81	449	434	107	964	1071
10/6/2003	5	38	0	58	223	157	38	438	476
5/22/2005	0	37	3	0	167	66	40	233	273
10/22/2006	0	0	0	0	143	79	0	222	222
10/29/2007	0	0	0	0	155	39	0	194	194
2/17/2008	0	0	0	0	258	203	0	461	461
4/12/2008	0	0	0	0	219	128	0	347	347
10/26/2008	0	0	0	0	223	79	0	302	302
10/25/2009	1	55	0	0	198	78	55	276	331
10/20/2011		0	0	0	212	92	0	304	304
10/18/2012	0	0	0	0	196	144	0	340	340

¹Stage-elevation zones correspond to the elevation reached by various discharge releases from Glen Canyon Dam.

10-15 = 10,000 ft³/s to 15,000 ft³/s

15-20 = 15,000 ft³/s to 20,000 ft³/s

20-25 = 20,000 ft³/s to 25,000 ft³/s

25-30 = 25,000 ft³/s to 30,000 ft³/s

30-45 = 30,000 ft³/s to 45,000 ft³/s

above 45 = above 45,000 ft³/s

low = 15,000 ft³/s to 25,000 ft³/s

high = above 25,000 ft³/s

total = all campsite area measured above 15,000 ft³/s

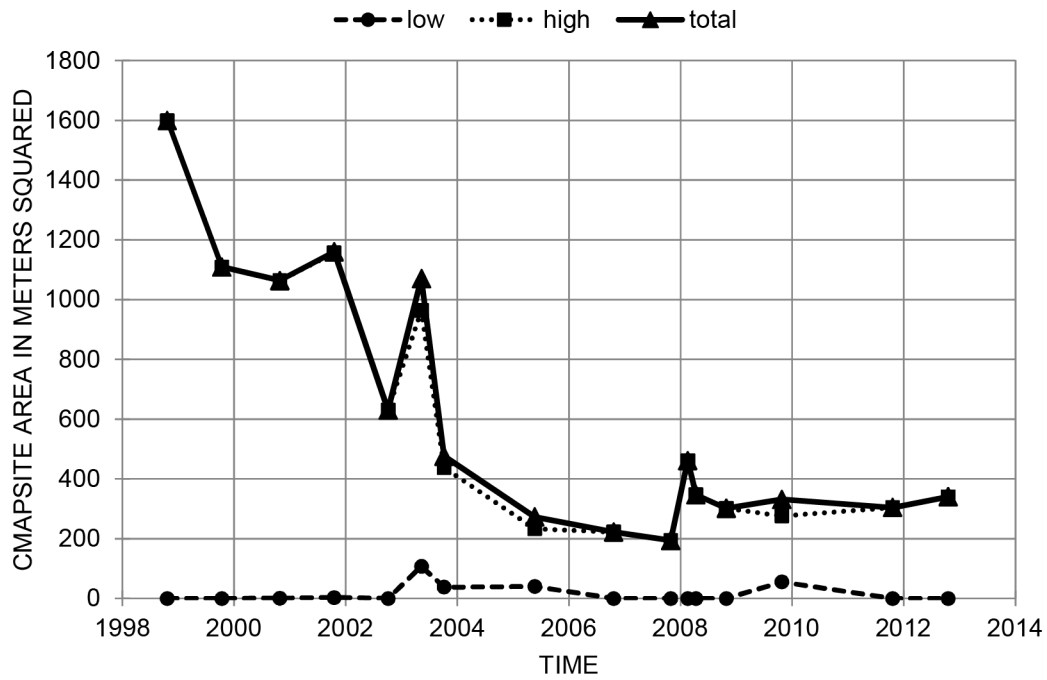
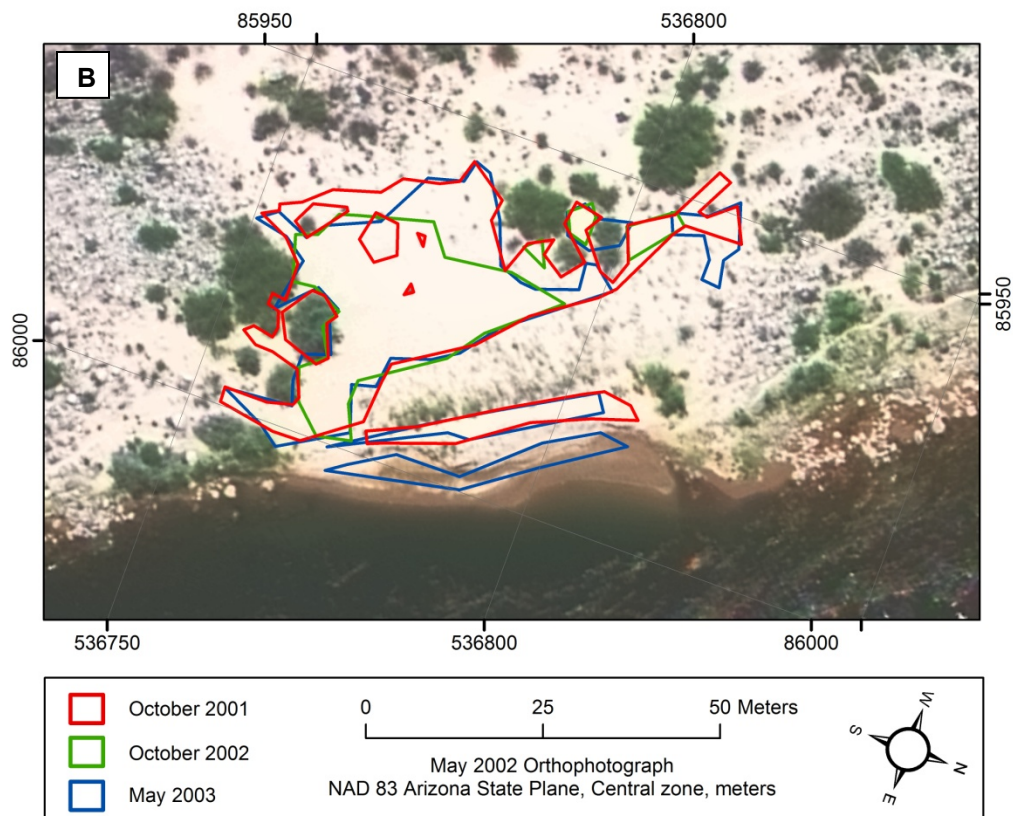
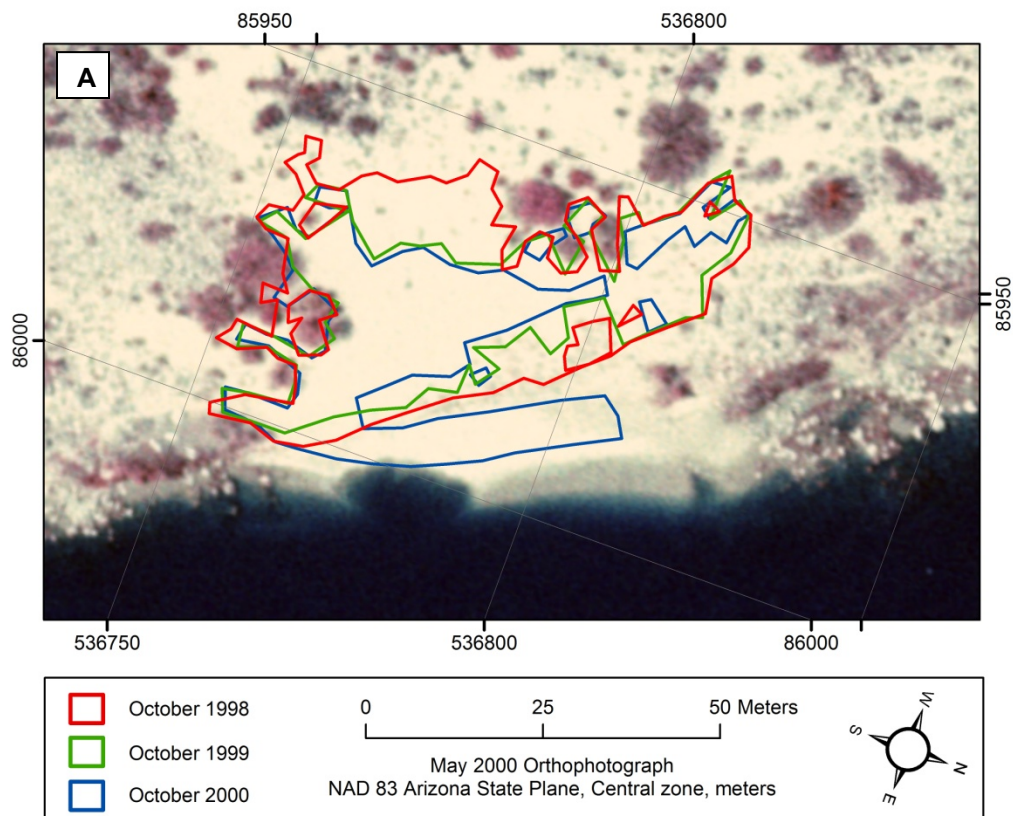
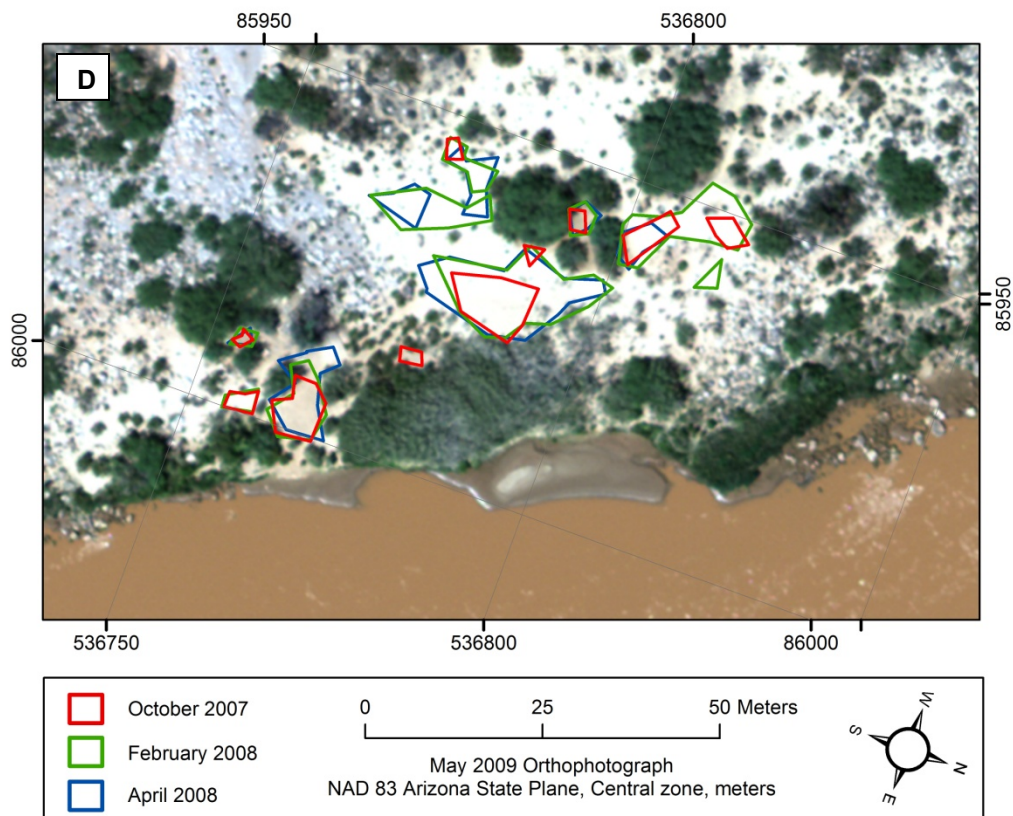
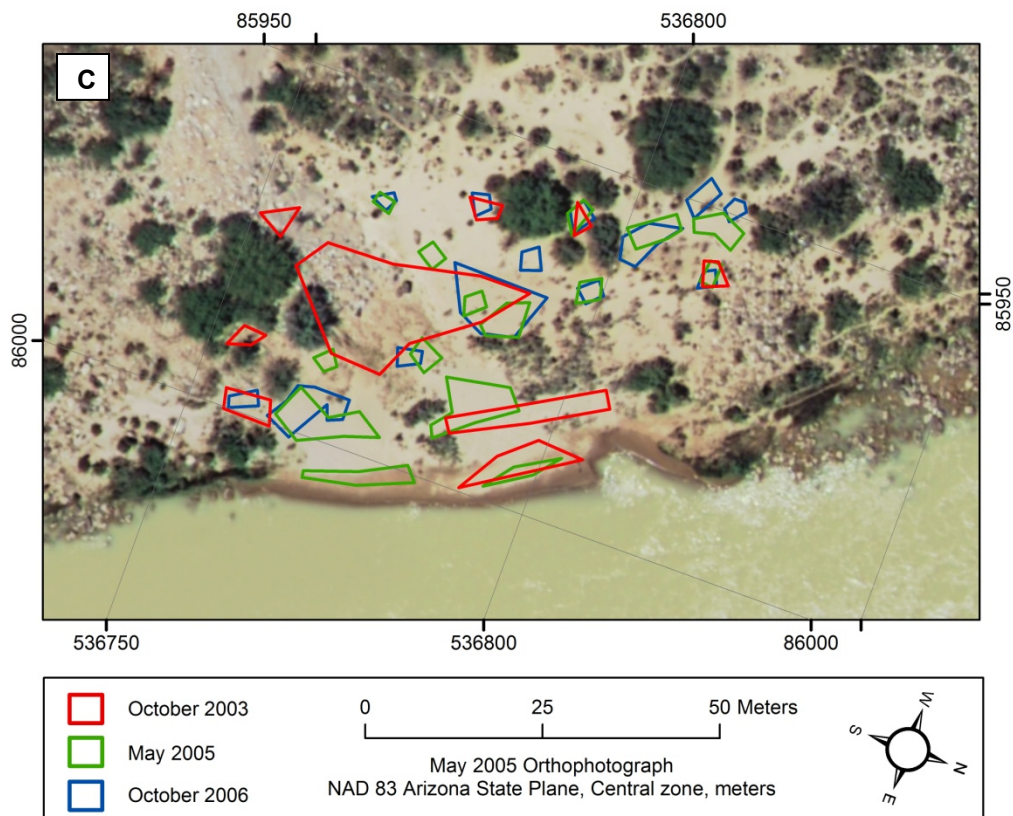


Figure A141. Time series plot showing campsite area at Middle 220 Mile camp (River Mile 220.1R) in the low stage-elevation zone (15,000-25,000 ft³/s), the high stage-elevation zone (greater than 25,000 ft³/s), and the total stage-elevation zone (greater than 15,000 ft³/s). Refer to table A37 for data.





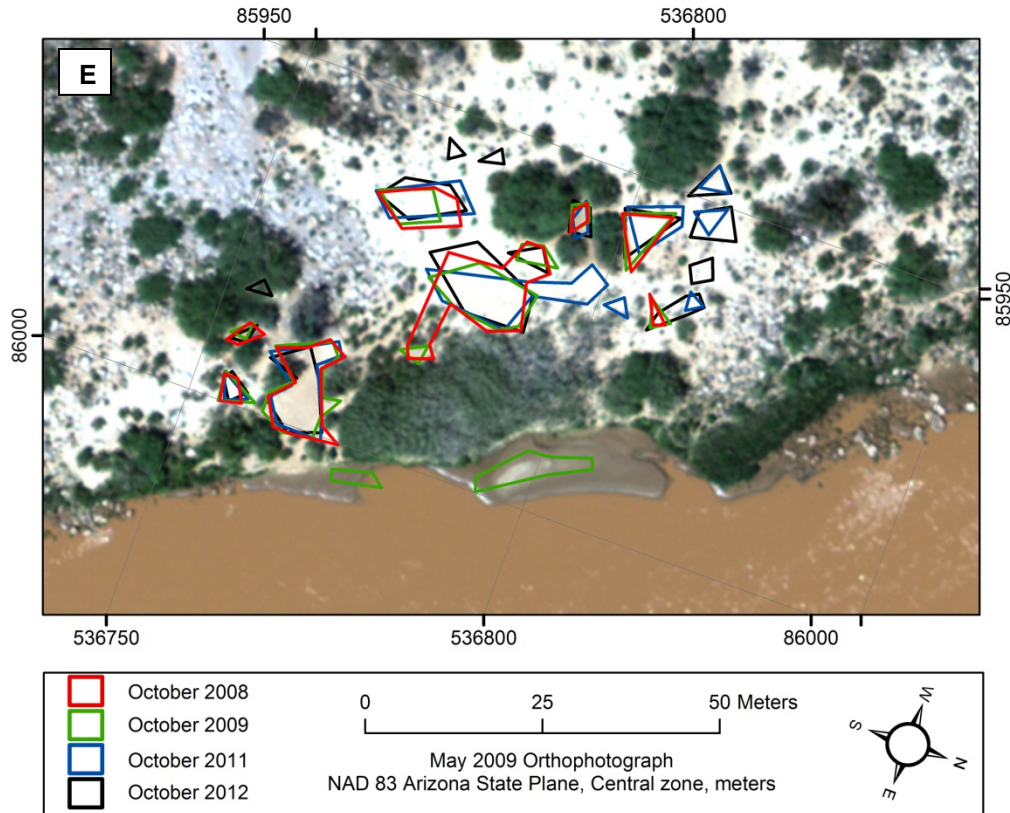


Figure A142. Maps showing campsite areas measured at Middle 220 Mile camp (River Mile 220.1R) from 1998 to 2012. Flow in main channel is from right to left. Aerial photographs were taken when discharge was approximately 8,000 ft³/s. (A) Aerial photograph taken in May 2000 with campsite area polygons measured on the October 1998, October 1999, and October 2000 survey trips shown in red, green, and blue lines, respectively. (B) Aerial photograph taken in May 2002 with campsite area polygons measured on the October 2001, October 2002, and May 2003 survey trips shown in red, green, and blue lines, respectively. (C) Aerial photograph taken in May 2005 with campsite area polygons measured on the October 2003, May 2005, and October 2006 survey trips shown in red, green, and blue lines, respectively. (D) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2007, February 2008, and April 2008 survey trips shown in red, green, and blue lines, respectively. (E) Aerial photograph taken in May 2009 with campsite area polygons measured on the October 2008, October 2009, October 2011, and October 2012 survey trips shown in red, green, blue, and black lines, respectively. Note that campsite area was not measured at every site during each survey trip. Survey years that did not measure the given campsite are not shown in figure explanations, whereas surveys that determined campsite area to be 0 are still shown in figure explanations.