The following supplement accompanies the article

Sea otter mortality in fish and shellfish traps: estimating potential impacts and exploring possible solutions

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Supplement. Supplementary materials on sea otter trap mortality studies, including photographic documentation and tables of raw data from the experiments described within the main article

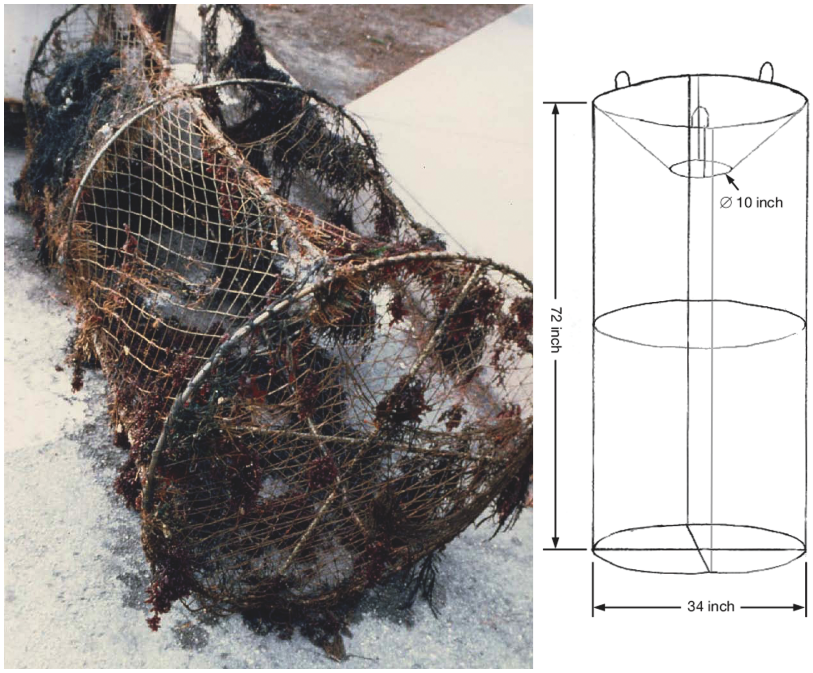

Fig. S1. *Enhydra lutris*. (A) Photograph and (B) line drawing of a derelict fish trap that drifted into Monterey Harbor in 1987 containing 2 drowned and bloated sea otters (1 adult female and 1 large male pup). Note the 10 inch (25.4 cm) diameter fyke opening

Fig. S2. *Enhydra lutris*. Photograph illustrating methods used to determine minimum ring diameter and minimum parallel bar spacing through which a sea otter carcass will fit (each measurement taken separately)

Fig. S3. *Enhydra lutris*. Photograph illustrating the series of panels with openings varying from 3.0 to 6.0inches (7.6 to 15.2 cm), used to determine what size rectangular openings live sea otters could transit (all panels had 9.0 inch [22.9 cm] wide openings)

Fig. S4. *Cancer magister*. Photograph illustrating the experimental setup used to determine the minimum size of rectangular openings that Dungeness crabs would transit voluntarily

Table S1. *Enhydra lutris*. Fate of 13 freshly drowned sea otters released back into the ocean at various water depths (sorted by water depth at release site). All 13 immediately sank, presumably to the bottom (modified and updated from Wendell et al. 1986). F: female, M: male; nd: not determined

Sea otter no.	Date	Sex	Age class	Length (cm)	Weight (kg)	Water depth (m) at release site	Carcass recovered?
1119-82	25-Oct-82	F	Subadult	109	14.5	11	Yes
1237-83	9-Oct-83	F	Adult	112	19	13	Yes
1118-82	25-Oct-82	M	Adult	nd	>23	18	No
1210-83	20-Jun-83	M	Adult	116	>23	18	No
1338-84	11-Jun-84	M	Subadult	107	19.1	18	Yes
1352-84	12-Jul-84	M	Immature	98	13.6	18	No
1247-83	18-Nov-83	M	Subadult	121	21.3	19	Yes
1337-84	9-Jun-84	F	Subadult	102	13.3	19	No
1173-83	26-Apr-83	M	Subadult	102	15	20	No
1174-83	26-Apr-83	M	Subadult	121	23	20	No
1335-84	4-Jun-84	F	Subadult	101	13.5	20	No
1230-83	11-Aug-83	M	Immature	92	11.8	22	No
1435-85	13-Aug-85	M	Immature	nd	~14	27	No

Table S2**.** *Enhydra lutris*. Data from 62 sea otter carcasses, showing the minimum rigid ring diameter and/or parallel bar height through which the entire body would pass. Age classes were assigned based on physical characteristics as follows: dependent pups ('P', usually <6 mo of age), immature animals ('IM', assumed to be age 0.5–1 yr), subadults ('SA', typically age 1–3 yr), adults ('AD', typically age 3–11 yr), and aged adult animals ('AA', typically age >11 yr). Measured weight for carcasses is highly variable, depending on degree of decomposition or emaciation prior to death; estimated (live) weight was calculated using an empirically derived length-weight relationship (see 'Materials and methods'). Initially, our largest rigid ring was 6.5 inches (16.5 cm) in diameter; we later incorporated rings up to 7.5 inches (19.1 cm) in diameter (1 inch = 2.54 cm). F: female, M: male; nd: not determined

Specimen no.	Age class	Sex	Length	Weight (kg)		Ring size	Rectangle
			(cm)	measured	estimated	(in)	width (in)
3461	P	F	67	2.8	4.3	3.50	2.50
3354	P	F	75	4.8	6	4.50	nd
3352	P	M	80	4.7	7.2	4.50	nd
4901	IM	F	82	5.1	7.7	4.50	2.50
3673	IM	M	82	6.2	7.7	4.75	2.75
3726	IM	F	83	5	8	4.00	2.50
3691	IM	F	84	5.7	8.3	4.25	2.50
3369	IM	M	84	6.1	8.3	4.50	2.75
3826	IM	M	86	8.2	8.9	4.75	3.00
3465	IM	M	87	5.2	9.2	4.25	2.75
3524	IM	M	87	7.9	9.2	4.75	3.00
3733	IM	M	88	6.9	9.5	5.25	3.25
3501	IM	M	89	7.1	9.8	5.00	3.00
3470	IM	F	90	4.8	10.2	4.25	3.00
3676	IM	M	90	7.2	10.2	5.00	3.00
3581	IM	F	90	7.4	10.2	4.75	3.00
3763	IM	M	91	7.4	10.5	5.00	3.50
3732	IM	M	92	7.1	10.8	4.50	2.75
3353	IM	M	94	8.8	11.5	5.50	nd
4987	SA	M	94	9.9	11.5	5.50	3.00
3749	IM	M	95	8.4	11.9	4.75	3.00
3528	IM	F	97	9.8	12.6	5.75	3.25
5134	IM	M	97.5	10.6	12.8	6.00	3.25
5139	SA	M	98	9.5	13	5.25	3.00
5082	IM	F	98	9.6	13	5.25	3.00
3597	IM	M	98	11.3	13	6.00	3.75
3370	IM	M	100	9.4	13.8	5.50	3.50
3472	IM	F	100	–	13.8	5.75	3.00
3429	IM	F	100.5	13.4	14	>6.50	4.75
3396	SA	M	101	14.4	14.2	>6.50	4.25
3702	SA	M	105	9.4	15.9	5.00	3.00
3318	AD	F	110	12.4	18.3	6.50	nd
3458	AD	F	113.5	11.8	20	6.50	3.50
3457	AA	F	114	10.6	20.3	6.00	4.00
3421	AD	F	115	17.5	20.8	6.50	4.50
3375	AD	F	116	15.8	21.3	6.75	3.75
3447	AD	F	116	19	21.3	6.75	4.50
3464	AD	F	117	15	21.9	7.50	4.25
3456	AD	F	117	18.8	21.9	7.50	5.00
3364	AD	F	119	13.2	23	6.50	4.75

3411	AA	F	119	19	23	>6.50	5.25
3412	AD	M	121	21.9	24.1	6.75	4.25
3349	AD	F	122	11.5	24.7	6.00	nd
3377	AD	M	123	23.6	25.3	>6.50	4.25
3400	AD	M	123	26.4	25.3	>6.50	5.25
3344	AD	M	124	16.2	25.9	6.50	nd
3402	AD	M	124	21.6	25.9	6.75	4.75
3391	AD	M	124	24	25.9	>6.25	4.25
3407	AD	M	124	32.2	25.9	>6.50	5.75
3420	AD	M	124.5	28.7	26.2	>6.50	7.25
3393	AD	M	125	21	26.5	6.75	4.25
3368	AD	M	125	–	26.5	>6.50	4.25
3340	AA	M	126	17.6	27.1	6.50	nd
3473	AA	M	127	16.4	27.8	>7.50	4.25
3471	AA	M	127	23.6	27.8	7.75	4.75
3392	AD	M	127	28.6	27.8	>6.50	6.00
3476	AD	M	129	32.4	29.1	>7.50	6.25
3363	AD	M	131	25	30.4	6.00	4.75
3428	AD	M	131	25.8	30.4	>6.00	5.50
3376	AA	M	131	28.4	30.4	>6.50	5.00
3401	AD	M	131	29.2	30.4	>6.50	5.25
3374	AA	M	137	25	34.7	>6.50	4.75

Table S3. *Cancer magister*. Experimental captive trials with live Dungeness crabs to determine minimum fyke-opening heights (in inches; 1 inch = 2.54 cm) necessary to allow passage

Trial no.	Outcome: 0 = transited, 1 = excluded	Fyke opening (in)	Carapace width (mm)	Crab ID
1	0	4.00	152	14
2	0	4.00	154	13
3	0	4.00	161	6
4	0	4.00	167	5
5	0	4.00	169	4
6	0	4.00	169	7
7	0	4.00	171	12
8	0	4.00	173	10
9	0	4.00	176	8
10	0	4.00	184	11
11	0	4.00	190	9
12	0	3.00	152	14
13	0	3.00	154	13
14	0	3.00	171	12
15	0	3.00	173	10
16	0	3.00	176	8
17	0	3.00	184	11
18	0	3.00	190	9
19	0	2.75	152	14
20	0	2.75	154	13
21	0	2.75	154	13

22	0	2.75	171	12
23	0	2.75	171	12
24	0	2.75	173	10
25	0	2.75	173	10
26	0	2.75	176	8
27	0	2.75	176	8
28	0	2.75	184	11
29	0	2.75	190	9
30	0	2.75	190	9
31	0	2.75	184	11
32	0	2.50	154	13
33	0	2.50	154	13
34	0	2.50	161	6
35	0	2.50	167	5
36	0	2.50	169	4
37	0	2.50	169	7
38	0	2.50	171	12
39	0	2.50	171	12
40	0	2.50	173	10
41	0	2.50	173	10
42	0	2.50	176	8
43	0	2.50	176	8
44	1	2.50	184	11
45	1	2.50	184	11
46	1	2.50	190	9
47	1	2.50	190	9
48	0	2.25	152	14
49	0	2.25	154	13
50	1	2.25	161	6
51	1	2.25	167	5
52	1	2.25	169	4
53	1	2.25	169	7
54	1	2.25	171	12
55	1	2.25	173	10
56	1	2.25	176	8
57	1	2.25	190	9
58	1	2.00	161	6
59	1	2.00	167	5
60	1	2.00	169	4
61	1	2.00	169	7

LITERATURE CITED

Wendell FE, Hardy RA, Ames JA (1986) An assessment of the accidental take of sea otters, *Enhydra lutris*, in gill and trammel nets. Mar Resour Tech Rep 54. California Department of Fish and Game, Sacramento, CA